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by L. Rossolimo

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Atlas of Remains of Organisms in Peat and Sapropel

By L. Rossolimo
Moscow 1927.

Foreword

Great strides were made in recent times in the 3*
investigation of post-glacial biogenic deposits, namely, peat and sapropel, as the latter is acquiring an ever growing significance for technical and agricultural purposes. The vast amount of research work accomplished to date in this field opens great possibilities for the utilization of peat deposits and, at the same time, clarifies their natural history, age, origin, development etc. In addition, the investigation of post-glacial deposits gives a broader picture than a precise knowledge of a specific peat bog. It makes it possible to establish a whole series of paleogeographical, climatological and hydrographical events in space and time. All this is related to that specific period in the history of the earth's surface, i.e., the Quarternary period, when the basic forms of the present day topography were being shaped. It may be said, without exaggeration, that our knowledge of post-glacial biogenic deposits is based to a great extent on the study of the most varied remains of organisms contained in peat and

*Numbers in the right-hand margin indicate the corresponding pages in the original.

sapropel. It is a known fact that these deposits represent an excellent preservation medium for animal and plant remains preserving these over long periods of time. We just have to recall the work of such investigators as Blit-Sernander, L. von Post and others in order to appreciate the achievements in this field.

Scanning literature dealing with the subject under discussion, our attention is immediately attracted to the fact that research into plant remains in peat and lake deposits has progressed much further than the study of animal remains. We must agree that most achievements in this field were based on botanical matter. In this respect, we have well established methods such as "pollen spectra" and "diatomaceous spectra" which make it possible to arrive at a very precise evaluation of a given
layer in peat or lake deposits. Moreover, the study of seeds 4.
and other plant remains also provides much valuable data regarding the past of a peat bog or lake. The reason for this emphasis on botanical rather than zoological matter is presumably due to circumstances and not because of the unsuitability of the latter. It is a fact that the investigation of peat was, and still is, in the hands of bog specialists, i.e., botanists and, therefore, it is perfectly natural that the zoological side of the question remained neglected. Then, it must be borne in mind that the main mass of a peat deposit is constituted by plant remains with animal remains merely disseminated within it. Lake deposits, wherein animal remains

are much more numerous, remained practically uninvestigated to the present day. It seems to me that all of this explains the present situation but does not exclude the fact that a study of animal remains would add much useful material to what has been achieved by botanists.

By looking ahead, let us now endeavour to estimate the results that may be expected from a study of animal remains and see to what degree this could extend our knowledge of the natural history of biogenic deposits of the Quarternary period.

Considerable progress was achieved in recent times in our understanding of ecological and zoogeographical matters. In this respect, data regarding the glaciation region, that is, the region with the most developed peat and lake deposits in Europe, is of particular interest. The glacial period and the subsequent sharp climatic fluctuations, as this becomes more and more obvious, were the very factors which to a great extent determined the fauna and flora distribution in central and northern Europe. These same factors were major determinants in the development of the ecology of animals and plants of this region. Thus, the study of the ecology and zoogeography of central and northern Europe is firmly linked to the all round study of the glacial and post-glacial periods. As an example, illustrating the fruitfulness of such an all round study, let us quote the establishment in zoogeography and phytogeography of the concept "glacial relict", which is now universally accepted and which sheds light on many obscure aspects in the geography of animals and plants and their ecology.

We devote so much attention to ecology because it is the only basis for a fruitful study of animal remains in deposits. Animal remains are important to us as witnesses of a specific period in the history of a bog or lake. We may judge 5.
the characteristics of such a period on the basis of our knowledge of the ecology of a given organism, the remains of which we may find. That is why, without a knowledge of ecology, the study of animal remains in deposits would be a totally useless process. Unfortunately, the present stage of our knowledge in the ecological field regarding those organisms with the remains of which we have to deal in deposits, is far from complete and, in the case of many forms, it is limited to the most general precepts. However, even this is usually sufficient to arrive at certain very valuable conclusions on the one hand and, on the other, modern ecology is making such rapid strides that in the not too distant future we will probably be able to work with more comprehensive and precise data.

When studying animal remains from bog and lake, we encounter great difficulties which also constitute the weak side of paleontology, namely, the incomplete capacity for preservation of remains of organisms. In this case, as in paleontology, the various zoological groups are far from being of equal value from a preservation point of view. However, peat and sapropel constitute a sufficiently good medium for the preservation not only of mineral parts of the organism but also of many organic and more or less dense structures as, for instance, chitin. Further on we shall consider in greater detail the question of the capacity for preservation of animal remains in peat and sapropel, as this is most important for the evaluation of deposits from a zoological point of view.

Thus, the overall tasks in the investigation of animal remains from biogenic deposits are fundamentally similar to those involved in the study of plant remains. To be precise, this means to recreate the fauna and flora of bygone days on the basis of remains of organisms and to follow through the changes in the plant and animal population from the initial formation of a given deposit to the present time. Then, on the basis of the knowledge of the ecology of the discovered organisms, to establish climatological, geographical, hydrological and other characteristics of the given area at any one point in time during the formation of the deposit. In fact, we have a common aim but deal in different subjects. We have already noted that the zoological side of the question has been very much neglected and our aim, when compiling the present atlas, was to make an attempt to eliminate at least partially the causes relegating the study of animal remains to a position of secondary importance. We consider one of the main reasons to be the fact that the investigation of peat and sapropel is almost exclusively in the hands of non-specialists for whom the study of zoological specimens, at times, moreover, consisting of small fragments, is outside their capabilities. It is also 6.

very difficult for the non-specialist to make use of source 6
material in order to identify a given specimen. He is confronted with large and specialized monographs dealing with a specific zoological group. Besides, such literature is not always available. Therefore, we believe that an atlas showing precise reproductions of animal remains found in peat, sapropel and other fresh water deposits reproduced from slides with the help of drawing instruments, could dispel these difficulties to a considerable extent. A brief description of the illustrated items and basic data regarding the ecology and biology of the organisms under consideration would give even the non-specialist the possibility of making at least an approximate assessment of a given find.

As far as we know, this is the first time that an attempt has been made to compile such an atlas and, therefore unavoidably, the data given therein cannot be considered as being exhaustive. The difficulty of our task is further compounded by the fact that literary sources concerning the subject under consideration are very scarce and consist at most of only a few works. We wish to mention the publication authored by I.I. Mesyatsev entitled "Fossil fauna of the Kosinskiye lakes"*which is the only source dealing

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*Articles published by the Kosinskiye Biological Station, Issue No. 1, 1924.

specifically with this question wherein the author presents information on lake deposits from a zoological point of view, lists animal remains and provides a few illustrations.

Therefore, when compiling this atlas, we had to rely almost exclusively on our own material, i.e., results obtained from investigations of peat and lake deposits. To this end, we made use of the extensive material in the form of peat and sapropel samples which are kept at the Central Peat Station of the Peoples' Commissariat of Soil Management (N.K.Z.)* Our investigations dealt mainly with material from the Msharovskoye, Talitsko-Plescheyevskoye and Somino bogs as well as from Lake Somino, all of which belong to the Pereslavl'-Usol'skiy swamp complex. Material from the Markovo-Sbornoye and Pistsevskoye bogs and from lakes Chernoye, Beloye, Poplavok, Kalevets, Sredneye, Rastovets, Pesetskoye and Obedovskoye of the Ivano-Voznesenskaya guberniya** was also studied.

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* N.K.Z. This abbreviation may be expanded to read "Peoples' Commissariat of Agriculture or Soil Management. Translator's note.

** Guberniya - An administrative division of pre-revolutionary Russia and early days of Soviet rule. Later renamed "Oblast". May be translated as "province". Translator's note.

CONDITIONS FOR THE PRESERVATION OF REMAINS OF ORGANISMS IN PEAT, SAPROPEL AND OTHER FRESH WATER DEPOSITS 7.

It was mentioned earlier that biogenic post-glacial deposits represent an excellent medium for preserving organisms from disintegration. Apparently a lack of oxygen and the halt of bacterial processes at certain depths are the main reasons for this phenomenon. But, no matter how excellent may be the conditions for preservation within deposits, we still deal with remains, a fact that must be borne in mind. When studying samples of peat and sapropel we become convinced that not all groups are found within the latter in the form of remains. Certain groups are lacking altogether, others are found only rarely while some are present frequently and in large numbers. Presumably because of their structure, a lack of calcic and silicious skeletal formations, dense shells and armor of chitin or chitin type matter, the groups in the first two instances mentioned above, disintegrate without trace of remains. Apparently, this takes place immediately after the organism ceases living as these are rarely found,even in contemporary layers, in peat or lake deposits.

Furthermore, the evaluation of the preserving properties of various types of peat and sapropel, which may differ substantially, is a very important factor. To make such an evaluation is not an easy matter at least at the present time as experimentation is excluded and more or less firm conclusiions must be made by comparing various factors.

In the case of calcic remains of organisms such as mollusc shells, the presence in the deposits of free acids is an important factor as these dissolve with ease carbonate compounds of calcium and thus disintegrate these shells fully or partially. The same may be said of the silicious parts of organisms such as the spicules of sponges and houses of Rhizopoda. It is true that silicates are less easily soluble in weak acids and require a very long period to dissolve. However, we often had occasion to observe spicules of sponges with clearly discernable traces of corrosion. Matters are entirely different in the case of organic remains of organisms such as carapaces of crustaceans, covers of insects and other arthropods, egg shells of various animals etc. The substance of those formations is very resistant to various mineral agents such as acids, alkali etc. In the same manner as cellular tissue, this substance decomposes due to the vital activity of special micro-organisms. Therefore, remains of chitin are always found in sufficient quantities right down to the deepest layers.

Below we list those groups of organisms which occur in deposits in the form of remains and make a notation as to which parts of these animals are involved.

Cladocera (Water fleas)

Sididae - end claws.

Daphnidae - end claws (undetermined as to type), parts of the postabdomen, ephippium.

<u>Bosminidae</u> - antennules, shells, postabdomen, end claws.

<u>Microthricidae</u> - shells, postabdomen, end claws.

<u>Chydoridae</u> - antennule, shells, postabdomen, end claws.

<u>Phyllopoda (Phyllopods)</u>

Shell valves.

<u>Ostracoda (Minute crustaceans)</u>

Shell valves.

<u>Spongiae (Sponges)</u>

Silicious spicules, birotulates.

<u>Rhizopoda</u>

Houses.

<u>Infusoria (Infusorians)</u>

Houses.

<u>Mollusca (Molluscs)</u>

<u>Gastropoda</u> - shells, calvaria.

<u>Lamellibranchiata</u> - shell valves.

<u>Insecta (Insects)</u>

<u>Diptera</u> - Chitin parts of water larvae.

<u>Coleoptera</u> - elytrum, mouth parts.

<u>Haemiptera</u> - eggs

Undetermined fragments of the chitin cover.

<u>Hydracarina (Water mites)</u>

Undetermined parts of the chitin cover.

<u>Bryozoa (Bryozoans)</u>

Statoblasts.

Pisces (Fish)

Cycloid and ctenoid scales, back bones.

DESCRIPTION OF ANIMAL REMAINS. BRIEF DATA ON ECOLOGY AND BIOLOGY

We have mentioned earlier that our information on the ecology and biology of organisms under consideration was insufficient and of a very general nature. Moreover, we do not have a file system wherein all the data regarding these questions would be collected and sorted out according to some sort of classification. Therefore, use of necessary information is very difficult as it has to be researched in a vast amount of specialized literature.

Our task does not include the provision of exhaustive data regarding all these problems. We have the intention of presenting that amount of information which would be sufficient to process material regarding peat and lake deposits in general terms only. A study in depth of this material to elucidate details of the past history of biogenic deposits, would require a perusal of all available literature dealing with the subjects of ecology, biology and zoogeography.

Just as it was done earlier in the case of the list
showing animal remains that are found in deposits, we will 10.
continue to adhere to the same order in listing zoological groups, i.e., not in the generally accepted sequence but according to the volume of their remains found in peat and sapropel.

Finally, let us point out yet another factor which is of importance when investigating animal remains. Very often, remains that are found are in the form of fragments or such parts of the organism which preclude identification not only as to species but even a broader taxonomical division. Such finds which do not have characteristic features are not identifiable and, except for rare cases, must be discarded altogether. Our atlas includes only those specimens which may be identified as to species.

Cladocera (Water Fleas)

Remains of crustaceans of this group undoubtedly represent the most interesting finds. These are found in the most varied bog and lake deposits in a reasonable state of preservation. Presenting an interest from the ecological and zoogeographical viewpoints, Cladocera always provide useful material for studying the history of the formation of a given deposit. Unfortunately, for an unexplained reason not all Cladocera families are preserved in the form of remains. Some of these are not to be found at all. Remains of such an interesting family as Daphnidae consist of small end claws, small fragments of postadomens, and other parts of the cover and ephippia which do not afford even the possibility of establishing the genera. (Besides reproductions of Cladocera remains, our tables* show drawings of crustaceans as such in order to assist the non-specialist in his study of remains).

* Revisor's note. Here and elsewhere in this translation, for "tables" please read "plates".

Sida crystallina (O.F. Müll). (Table I, figure 1). The small end claw is the only part of this form that is preserved in deposits (Table I, figure 2). This formation is so typical that it may be identified without error. No other identifiable parts of the chitin cover of S. crystallina are ever found.

This species is widely distributed in the entire northern hemisphere and is found in most places in Europe, Siberia, Turkestan, China, Egypt, North America and the United States. It occurs in the north up to Iceland and is found in mountain waters of the Scandinavian Peninsula.

It is also found in various, primarily large bodies of fresh clear water and among vegetation in the littoral zone.

Simocephalus exspinosus (Koch), (Table I, figure 3). 11.
Remains of this small crustacean are rarely seen. We found an end of the back surface of a postabdomen with several pairs of large teeth (Table I, figure 4) and a small end claw. (Table I, figure 5).

S. exspinosus is geographically very widely distributed. Europe, Central Asia, North Africa, North America and the States; to the north, up to Greenland.

Usually inhabits small swamps and pools as well as larger bodies of water of the littoral zone. It is also found in desalinized off-shore waters of Sweden and Denmark.

Daphnidae. Of a large number of non-identifiable remains which presumably belong to this family we quote ephippium (Table I, figure 6) which is often found in deposits.

<u>Genus Bosmina</u>. Remains of specimens of this genus are common and numerous in deposits. It is a known fact that this genus encompasses a vast number of forms and varieties which are very changeable. Unfortunately, the systematics of all these forms as yet cannot be considered as having been fully established and the autonomy of many of these is doubtful. These circumstances make it very difficult to process remains of specimens of this genus. Moreover, most of the characteristics by means of which species and varities are differentiated cannot be used in the case of those remains with which we have to deal. Therefore, little of what is found in deposits is of any use. Below we list several forms which may, to a certain degree of certitude, be identified by their remains.

<u>Bosmina longirostris</u>. (O.E. Müller). (Table I, figure 7). Antennules are particularly common in deposits, sometimes together with the cephalic scutellum, at times in the form of fragments. (Table I, figure 8). Shells are similarly common (Table I, figure 9). Unfortunately, it cannot always be determined with which of the numerous varieties of this species we are dealing.

The main form and varieties are geographically very widely distributed: Europe, Central Asia, Siberia, North America and the United States.

All forms of this species are common to the littoral of lakes and slow flowing rivers where they are found among water vegetation. These are also found in small bodies of water, ponds, pools and swamps.

B. longirostris var. cornuta (Jurine). (Table I, figure 10). In the case of this variety only antennules which stand out by their bent shape are found in deposits (Table I, figure 11).

The geographic distribution and habitat are the same as for the main form. 12.

Bosmina obtusirostris. G.O. Sars. Remains of this form and several of its varieties are common in deposits but unfortunately are not easily identifiable.

This species and its varieties are distributed mostly in the north of Europe (Scandinavia, Greenland, Iceland, and the Kola Peninsula). These are also found in Siberia and on Bering Islands.

Found in various bodies of fresh water except small water bodies; also in desalinized waters of the Baltic (var. Maritima).

B. obtusirostris s. str. G.O. Sars. (Table II, figure 1). Characteristic by the shape of the antennule which, when found in deposits, may be identified as belonging to this variety (Table II, figure 2).

See above for the distribution and location of this variety.

B. obtusirostris var. arctica, Lilljeborg. (Table II, figure 3). The shell which we associate with this variety has two crenae on rear spine. Naturally, this feature is not sufficient for a positive identification, therefore, the association of this shell (Table II, figure 4) with the present variety is tenuous.

The distribution of this form is limited to the north (northern Scandinavia).

Bosmina longispina s. str. Fr. Leidy. (Table II, figure 5). Remains of this form consisting of shells and postabdomens with small end claws. (Table II, figures 6 and 7) are very common in deposits.

Bosmina coregonis str. Baird (Table II, figure 8). We consider shells lacking a rear barb as belonging to this form (Table II, figure 9).

Varieties of this species are distributed throughout Europe.

Found in plankton of the pelagic zone of clear water lakes.

Drepanothrix dentata (Euren). (Table III, figure 1). Remains of the chitin cover of this form preserve well. We find shells that have retained their sculpture (Table III, figure 2) and postabdomens with small end claws (Table III, figure 3). These remains are sufficiently characteristic for positive identification.

D. dentata is found in Europe primarily in near-Baltic countries (Sweden, Norway, Finland and Denmark). It is also known in the United States.

It is found in large bodies of water mostly near swampy banks, in silt among vegetation, at depths from 0.5 to 2 m.

Eurycercus lamellatus (O.F. Müller). (Table III, figure 4). The postabdomen of this form comes mostly in fragments. Sometimes 13.
it is found intact (Table III, figure 5), together with the end claw (Table III, figure 7). Antennules are much rarer (Table III, figure 6). All these parts are sufficiently characteristic.

E. lamellatus is found in Europe and the United States; to the north it reaches the Kola Peninsula having been noted on the coastline of the Barents Sea.

It is found in large bodies of water- lakes, ponds, slow flowing rivers and marshes; in the littoral zone among vegetation. This form was also discovered in strongly desalinized waters of the Bothnian Strait.

Camptocercus rectirostris (Schoedler). (Table 111, figure 8). In the case of this form, the shell (Table 111, figure 9) and postabdomen without the end claw (Table 111, figure 10) are well preserved.

C. rectirostris is widely distributed in the whole of Europe and in the United States.

It is found in the littoral zone of large bodies of water among vegetation along the shore line. Remains usually at the silty bottom.

Alonopsis elongata. G.O. Sars (Table 111, figure 11). The sculpture of the shell is well preserved in deposits (Table 111, figures 12 and 13). In addition, the postabdomen is also found (Table 111, figure 14).

A. elongata is a widely distributed in Europe mostly in central and northern parts.

It favours large and clean bodies of water with sandy banks where it remains among vegetation.

Acroperus harpae. Baird. (Table 1V, figure 1). The postabdomen (Table 1V, figure 2) and end claw (Table 1V, figure 3) are found in deposits. A precise identification is not always easy as these resemble similar parts of closely related forms.

A. harpae is widespread in Europe, Siberia and the United States. Reaches far to the north - Kola Peninsula, Iceland and Greenland.

Encountered in the littoral zone of large bodies of water as well as in pools and marshes. According to the authors, this form was initially found only in large bodies of water and eventually spread to smaller ones.

Alona quadrangularis (O. F. Müll). (Table 1V, figure 4). The postabdomen, end claws and shells (Table 1V, figures 5,6 and 7) remain preserved.

Widely distributed in Europe and the United States and was even noted in the Azores.

Usually found in large bodies of water where it reaches 14.
considerable depths. It may also be noted in marshes.

Alona guttata (G. O. Sars). (Table 1V, figure 8). The shell of this form is easily identified by the good state of preservation and characteristic sculpture. (Table 1V, figure 9).

A. guttata is a fairly rare form. It is distributed in Europe where it reaches the Alpine region, in Asia Minor and the United States.

It is found in marshes, pools, holes and near the edge of larger bodies of water. Rhynchotalona rostrata (Koch.). (Table 1V, figure 10). Postabdomens and shells of this form were found in deposits (Table 1V, figures 11 and 12).

Geographic distribution: Europe and the United States. Found at sandy beaches of lakes among water plants.

Graptoleberis testudinaria (S. Fischer). (Table lV, figure 13). The shell of this form features a well-defined sculpture and two large barbs at its rear (Table lV, figure 14). This is a widely distributed species. Common in Europe, reaching as far down as the Mediteranean Sea. In the north it was found in Greenland. It has also been noted in Asia and the United States.

It is found along the shore of large lakes as well as in marshes and smaller bodies of water.

Alonella excisa (Fischer). (Table lV, figure 15). The shell and postabdomen of this form are fairly characteristic; especially the former which stands out by a well-preserved diamond shaped sculpture with thin longitudinal hachures (Table lV, figures 16 and 17).

This species is widely distributed in Europe, Siberia and the United States. It reaches far to the north and to the Alpine zone.

It is found along the shores of large bodies of water, in marshes and pools.

Alonella nana (Baird). (Table lV, figure 18). Shells and postabdomens are preserved in deposits. The former are easily identified by characteristic hachures. (Table lV, figures 19 and 20).

A. nana has the same distribution as the preceding species.

It is found in large bodies of water and lakes, at the shoreline among water plants. Also noted in marshes; on rarer occasions in small bodies of water.

Peracantha truncata (O.F. Müller). (Table V, figure 1). The shells of this form may be easily identified in deposits by the toothed frill on the rear edge (Table V, figure 2). 15.

This form is common to Europe and Siberia.

It is found along the shoreline of lakes and small bodies of water.

Pleuroxus aduncus (Jurine). (Table V, figure 3). The shells of this form are characteristic by their hachures which are well preserved in deposits and by several small barbs at the rear lower angle. The number of the barbs may vary. (Table V. figures 4 and 5).

P. aduncus is widely distributed in Europe, Central Asia, Asia Minor, North Africa and South America. It does not extend north further than Upsala.

It is common to small ponds, marshes and is present along the shoreline of larger bodies of water.

Pleuroxus uncinatus (O.F. Müll). (Table V, figure 6). The shell has 4 - 7 large bent barbs at the rear lower angle. Therefore, the species may be recognized by fragments which have retained this feature. (Table V, figures 7 and 8).

Although present in Europe, it is not very common.

Found exclusively in large bodies of water and lakes, along sandy beaches amidst vegetation.

Chydorus sphaericus (O.F. Müll). (Table V, figure 9). Shells of this form with a well-preserved sculpture are common in deposits either intact or in fragments. (Table V, figure 10).

This species is widely distributed in both hemispheres. In the north, it may be noted in Greenland and on Novaya Zemlya.

The species is common to various fresh water bodies and may be found in brackish waters of the Gulf of Bothnia.

Chydorus globosus (Baird). (Table V, figure 11). Shells are seldom found in deposits and only in the form of fragments. The sculpture and size are characteristic (Table V, figure 12).

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Ch. globosus is found in Europe, Siberia, and the United States. It is also known in Australia.

It is found also along the shoreline of large lakes amidst water plants and also in deep peat excavations.

Monospilus dispar (G.O. Sars). (Table V, figure 13). The shell may be of different shapes but has a very characteristic structure and may be identified without difficulty (Table V, figure 14).

Distributed in Europe, Asia Minor and the United States.

Found exclusively in lakes where it remains on the 16. silty bottom near the shore. It also may be located at a substantial depth.

Phyllopoda

Limnadia lenticularis (L). (Table VI, figure 1). Large transparent valves of shells of this crustacean (Table VI, figure 2) are relatively rare in deposits.

L. lenticularis is found in Europe in various bodies of fresh water.

Ostracoda (Minute crustaceans)

Eurycypris Virens. Iur.

Cypris pubera. O.F. Müll.

The valves of shells of these two forms are not very common in deposits (Table VI, figures 3 and 4).

These forms are found in various bodies of water, pools, holes, ditches and near the shoreline of larger water bodies.

Bryozoa (Bryozoans)

Plumatella fungosa. Pall.

Statoblasts of bryozoans represent a formation of a protective nature and, therefore, are well preserved and numerous in deposits. We found statoblasts of only one species (Table Vl, figure 5) but it must be presumed that other species will be discovered.

P. fungosa, as well as other species of fresh water bryozoans are widely distributed from a geographic point of view. They inhabit the most varied bodies of water starting from small pools to shorelines of large lakes and rivers.

Spongiae (Sponges)

Remains of silicic skeletons of sponges are found in deposits of lakes, rivers etc., i.e., only in deposits of larger bodies of water. Peat and other bog deposits usually do not contain remains of sponges which is natural considering the habitat of these organisms.

Spongilla lacustris (L).

Silicic skeletal parts of this sponge in the form of macroscleres and microscleres (Table Vl, figures 6 and 7) are found in massive quantities in certain layers of deposits. 17.
Usually these formations are found intact but spicules are sometimes observed to have traces of partial

disintegration. We show an illustration of such a spicule with characteristic signs of corrosions (Table Vl, figure 8).

This species is widely distributed and very common in stagnant and running waters.

Spongilla fragilis (Leidy)

We found macroscleres and microscleres of this species (Table Vl, figures 9 and 10).

This species is common to Europe and Asia right up to the Kamchatka.

Ephydatia Mülleri Liebk.

Macroscleres and birotulates (Table Vl, figures 11 and 12) are not as common in deposits as the skeletal parts of the two preceding species.

In Europe this species is found in various fresh water bodies but is by far not as common as species of the genus Spongilla.

Carterius Stepanovi Petr.

Microscleres and birotulates (Table Vl, figure 13) are particularly characteristic among skeletal parts of this sponge.

The geographic distribution of this species has not yet been fully established. Most finds were made in the eastern part of Europe.

Rhizopoda

As the vast majority of rhizopoda similarly to nearly all protozoa, are cosmopolitan, the question of their geographic distribution is of little interest. The same cannot be said of their ecology which, to date, has not been sufficiently investigated. With our present level of knowledge of the subject, we are in a position to identify forms common to large bodies of clear water, bogs of different types, marshy or simply humid soil etc.

From the point of view of the preservation of rhizopoda remains in peat and lake deposits, this group presents the greatest interest to us. Houses of chitinous substance or of silicic particles represent very stable formations which fully retain their form and structure.

The list of forms we have found undoubtedly does not contain everything that is preserved in deposits as there is no reason to believe that among the vast number of known species, the houses of some are preserved while those of others are not. Apparently, nearly all rhizopoda are of equal interest in that respect and their houses will be found during further 18.
investigations of peat and lake deposits.

Difflugia pyriformis. Perty. (Table VII, figure 1). Found in the most varied bodies of water, mostly in lakes, ponds and river crescents.

D. pyriformis. Perty var. nodosa Leidy. (Table VII, figure 5). In small ponds.

D. pyriformis. Perty var. claviformis. Penard (Table VII, figure 4). Deep water lake form. Was to be found in large lakes at depths of 20 - 30 meters.

D. pyriformis var. lacustris. Penard. (Table VII, figures 2 and 3). This form is found at the bottom of large lakes but is also known to be present in smaller bodies of water. (This variety is not sufficiently distinct morphologically from other varieties of this species).

Difflugia capreolata. Penard. (Table VII , figure 6).

A rare species found in ponds.

Difflugia accuminata. Ehrenberg. (Table VII, figure 8). Lakes, ponds, marshes.

D. accuminata var. inflata. Penard. (Table VII, figure 9). This variety is found mostly in lakes.

Difflugia elegans. Penard.(Table VIII, figure 4). Various fresh water bodies.

Difflugia varians. Penard. (Table VIII, figure 3).

Difflugia curvicaulis. Penard. (Table VII, figure 7). Characteristic deep water lake form.

Difflugia fallax. Penard. (Table VIII, figure 5). A fairly rare species. Ponds, lakes, marshy rivers, springs.

Difflugia lanceolata. Penard. (Table VII, figure 7). Pond form.

Difflugia globulosa. Dujardin. (Table VIII, figure 2). Found in ponds, marshes and oxbow lakes.

Difflugia bidens. Penard. (Table VIII, figure 6). Marsh form .

Difflugia urceolata. Carter. (Table VII, figure 14). Ponds, oxbow lakes, ditches, marshes.

Difflugia hydrostatica. Zacharias. (Table VII, figure 13). Plankton form, found in pelagic part of lakes.

Difflugia lobostoma. Leidy. (Table VII, figure 12). Ponds, marshy bodies of water, oxbow lakes.

Difflugia limnetica. Lewander. (Table VIII, figure 8).

Lake and pond form.

Difflugia lithoplies. Penard. (Table VII, figure 15).

Ponds, marshes.

Difflugia corona. Wallich. (Table VII, figure 10).

Ponds and other small bodies of water.

Difflugia amphora. Leidy. (Table VIII, figure 1). 19.

Ponds, lakes, river crescents.

Difflugia constricta. Ehrenberg. (Table VII, figure 11).

Ponds, ditches, marshes, moss pads.

Centropyxis aculeata. Stein. (Table VIII, figure 9).

This form is widely distributed in various fresh water bodies, predominates in marshes among sphagnum.

Pontigulasia incisa. Rhumbler. (Table VIII, figure 12).

Pontigulasia spiralis. Rhumbler. (Table VIII, figure 13).

Ponds, ditches.

Pontigulasia bigibbosa. Penard. (Table VIII, figure 11).

Shoreline of lakes.

Lequeresia spiralis. Ehrenberg. (Table VIII, figure 10).

Sphagnum bogs, marshy shores of lakes.

Hyalosphenia papilio. Leidy. (Table VIII, figure 14).

Sphagnum bogs, bodies of water with sphagnum floats.

Hyalosphenia elegans. Leidy. (Table VIII, figure 15).

This form is characteristic of sphagnum bogs.

Nebella collaris. Leidy. (Table VIII, figure 16).

Sphagnum bogs, sphagnum moss pads.

Arcella vulgaris. Ehrenberg. (Table VIII, figure 17). This form is widespread in the most varied bodies of water.

Arcella costata. Ehrenberg. (Table VIII, figure 12).

Arcella stellaris. Perty. (Table VIII, figure 19).

Cyphoderia ampulla. Ehrenb. (Table VIII, figure 20). Lakes, ditches, streams.

Euglipha alveolata. Dujardin. (Table VIII, figure 21). Lakes, ponds.

Euglipha cristata. Leidy. (Table VIII, figure 22). Marshes, lakes with marshy shores.

Trinema enchelys. Egrenberg. (Table VIII, figure 23). Primarily in sphagnum, sphagnum bogs; more rarely found in filamentous alga, pools and ponds,

Ditrema flavum. Archer. (Table VIII, figure 24). Sphagnum bogs.

Infusoria (Infusorian)

Similarly to rhizopoda this group of protozoa does not present an interest from a zoogeographic point of view. Besides we have only one species of infusorian in deposits. This species belongs to the Tintinnodea family, the characteristic feature of which is a dense house which accommodates the plasma body of the infusorian. A very large number of species of this family are marine forms with the exception of three or four which are fresh water species. Of these, only the Tintinnopsis 20.

lacustis has a dense house. Others (genus Tintinnidium) have houses of a jelly-like substance.

Tintinnopsis lacustris. Entz. (Table VIII, figure 25). The houses which are well preserved in deposits consist of an organic chitinous substance which is encrusted with silicic particles.

This plankton form is found in more or less large bodies of water - lakes, ponds and rivers.

Mollusca (Molluscs)

Remains of molluscs are by no means found in all deposits and, therefore, cannot be considered as common finds. Nevertheless, molluscs are of great interest to us for several reasons. Firstly, the shells of molluscs are sometimes found in great quantities in certain layers and we thus have have an opportunity of making an assessment of that layer at one and the same time. Secondly, the great majority of molluscs are very sensitive to their environment and, therefore, a fairly accurate evaluation may be made of a given body of water by investigating the species that it contains. Finally, the facts that mollusc shells are well preserved and possess the most characteristic traits, make this group one of the most valuable among fossils. If one is to consider the knowledge we have of the ecology of fresh water molluscs, then it may be stated without reservations that the significance of this group in the study of post-glacial deposits will be no lesser than their importance in paleontology as a whole.

In matters of ecology, faunistics and zoogeography, we refer to Russian and foreign literature and keep within the established framework, i.e., the provision of basic data. Let us note in terms of a general statement that the distribution of the various species, varieties and morphological types of molluscs in water bodies is affected by a whole series of physical-chemical factors.

On this basis, we differentiate the type of forms which are characteristic of running and stagnant waters, large lakes, ponds, pools and other small bodies of water, not to mention bogs, marshy waters and bodies of clear water with sandy shores.

Limnaea stagnalis L. (Table IX, figure 1). Large shells seldom preserved intact but the species may be determined by the fragments.

This form varies considerably both as to the shape 21
and size of the shell. When processing available data, it is very important to differentiate the morphological classifications of this species which are of an ecological nature. These may determine the nature of the body of water which they inhabit.

L. stagnalis is a Holarctic species and is widely distributed in the whole of Europe, Asia and North America.

Different morphological types of this species are found in the most varied bodies of water from large lakes and slow-flowing rivers to marshes and pools.

Radix auricularia L. lagotis (Table IX, figure 2). Because the shells of this form are fragile and thin-walled, undamaged specimens are rarely found.

This form is widespread in the palearctic.

Found in small silted bodies of water, ditches, ponds and oxbow lakes.

Radix ovata. Drap. (Table IX, figure 3). The shell of this species is also thin-walled and is usually found in a damaged condition.

Besides the main form we managed to identify in the material available to us two other varieties, namely, obtusa kob. (Table IX, figure 4), and fontinalis (Table IX, figure 5).

This species with its varieties is widespread in Europe and Asia.

It is common to stagnant waters, oxbow lakes, etc.

Stagnicola palustris Müll. (Table IX, figure 6). Holarctic form, widely distributed from the north of Africa to Lapland.

This species with its many varieties is found in small stagnant vegetation covered bodies of water, bogs, pools etc.

Galba truncata Müll. (Table IX, figure 7). This species is distributed along the Mediterranean coast of Africa and Europe, right up to the north and also in Asia.

Found in small fresh water bodies, holes and slow-flowing streams heavily overgrown with vegetation.

Coretus corneus L. (Table IX, figure 8). Large and undamaged specimens are rarely found.

This species is distributed in Europe; in the south to the Caucasus; in the north to Archangel and Stockholm; in the east up to Lake Baykal.

Found in stagnant bodies of water.

Spiralina vortex L. (Table IX, figure 9). This form is well preserved in deposits.

In Europe it spreads to central Italy; in the north to Bergen and Archangel; in Asia, east to the river Yenisey.

Found in stagnant bodies of water. 22.

Gyraulus albus Müll. (Table IX, figure 10). A Holarctic species. In the south it does not reach the Mediterranean Sea; in the north to 70° latitude.

The most widely distributed varieties are found in small stagnant bodies of water, bogs, vegetation invaded holes and pools.

Gyraulus gredleri. Gredler rossmaessleri Auerswald.
(Table IX, figure 11). Distributed in Europe and Siberia.

Found in marshy areas, forest pools etc.

Batyomphalus contortus L. (Table IX, figure 12). The species is distributed in Europe. In the south, it reaches the Caucasus and the Po rivervalley; in the north, the 69th parallel. In Siberia, it reaches the river Amur.

Found in lakes, ponds, bogs and pools.

Armiger crista L. Two varieties of this species were found: nautileus L. (Table IX, figure 13) and cristatus L. (Table IX, figure 14).

This species is widespread in the whole of Europe from the shores of the Mediterranean Sea in the south to Finland and Sweden in the north (65°north).

Found in vegetation covered ponds and marshes.

Segmentina nitida Müll. (Table IX, figure 15). Besides the main form, the distinguenda Gredler variety was also found (Table IX, figure 16).

The species is distributed in the whole of Europe and Siberia; in the south to the shores of the Mediterranean Sea; in the north to Stockholm and Leningrad.

Usually found in water-logged fields.

Vivipara vivipara Müll. (Table IX, figure 17). This large form is seldom found intact.

Distributed in Europe in plains and low-lying regions.

Found in stagnant bodies of water heavily overgrown with vegetation.

Bythinia tentaculata L. (Table IX, figure 18). A Holarctic species. In Europe from the shores of the Mediterranean Sea in the south to Sweden and Archangel in the north.

A very common form, found in the most varied waters both flowing and stagnant.

Valvata piscinalis Müll. (Table IX, figure 19). Numerous varieties of this form are distributed in Europe from the Mediterranean Sea to northern seas; in Siberia to the river Amur. Various varieties are found in rivers, lakes, marshes, ponds etc.

A variety of this species which we found, namely, var. antiqua sow. (Table IX, figure 20) is common to lakes.

Valvata pulchella studer. (Table IX, figure 21). 23.
In the south of Europe, it apparently does not reach the shores of the Mediterannean Sea. In the north, it spreads to Sweden. It is also known in Siberia.

Found in silted holes and marshy pools.

Valvata naticina Menke. (Table IX, figure 22). Widespread in Europe but unknown in the eastern part of the USSR.

Found in silt of rivers and lakes.

Valvata cristata Müll. (Table IX, figure 23). Known in Europe and Siberia. Unknown in southern parts of Mediterannean countries. Reaches Sweden in the north (65^{o}north).

Found exclusively in various stagnant bodies of water.

Sphaerium corneum L. (Table IX, figure 24). Often occurs in deposits in the form of fragments; more rarely as entire valves.

Widespread in Europe and Siberia. In the south to the Caucasus; in the north to Lapland (70^{o} north).

A polymorphic species common to stagnant bodies of water; holes, ponds and oxbow lakes.

Among mollusc remains we sometimes find fragments of large bivalve mollusc which may belong to the Anondonta or Unio species. The species concerned are widely distributed in Europe and are found in more or less large bodies of water - lakes and rivers. Unfortunately, remains of this most ecologically interesting group cannot be used to the fullest measure as fragments being found are not sufficient for a positive identification.

Besides mollusc species listed herein, large numbers of valves of molluscs belonging to the genus Pisidium are found in deposits. Unfortunately, as a systematic processing of this material is extremely difficult and may be performed by only a few specialists, we had to forego the inclusion of illustrations and lists dealing with forms of this genus, at least for the present time.

TABLES

Figures shown in brackets thus [ ] after the nomenclature of forms denote the page numbers in the original text where these forms are described.

The translation of Russian terms in the description of the tables are shown immediately after the table concerned.

TABLE I

Таблица I.

Рис. 1. Sida crystallina (*O. F. Müller*). [10]
Рис. 2. " " " Концевой коготок. Ap. 8 mm. Comp. oc. 6.
Рис. 3. Simocephalus exspinosus (*Koch*). [11]
Рис. 4. " " " Конец спинного края постабдомена. Ap. 4 mm. Comp. oc. 6.
Рис. 5. Simocephalus exspinosus (*Koch*). Концевой коготок. Ap. 8 mm. C. oc. 6.
Рис. 6. Эфиппиум. (Daphnidae). Ap. 8 mm. Comp. oc. 4. [11]
Рис. 7. Bosmina longirostris (*O. F. Müller*). [11]
Рис. 8. " " " Антенны I пары. Ap. 4 mm. Comp. oc. 4.
Рис. 9. Bosmina longirostris (*O. F. Müller*) Раковинка. Ap. 8 mm. Comp. oc. 4.
Рис. 10. B. longirostris var. cornuta (*Iurine*). [11]
Рис. 11. " " " Антенны I пары. Ap. 4 mm. Comp. oc. 4.

Tafel I.

Fig. 1. Sida crystallina (*O. F. Müll.*). [35]
Fig. 2. " " " Endkralle. Ap. 8 mm. Comp. Oc. 6.
Fig. 3. Simocephalus exspinosus (*Koch*). [36]
Fig. 4. " " " Rückenseite des Hinterleibes. Ap. 4 mm. Comp. Oc. 6.
Fig. 5. Simocephalus exspinosus (*Koch*). Endkralle. Ap. 8 mm. C. Oc. 6.
Fig. 6. Ephippium (Daphnidae). Ap. 8 mm. Comp. Oc. 4. [36]
Fig. 7. Bosmina longirostris (*O. F. Müll.*). [36]
Fig. 8. " " " I Antennae. Ap. 4 mm. Comp. Oc. 4.
Fig. 9. Bosmina longirostris (*O. F. Müll.*). Schale. Ap. 8 mm. Comp. Oc. 4.
Fig. 10. B. longirostris var. cornuta (*Iurine*). [37]
Fig. 11. " " " I Antennae. Ap. 4 mm. Comp. Oc. 4.

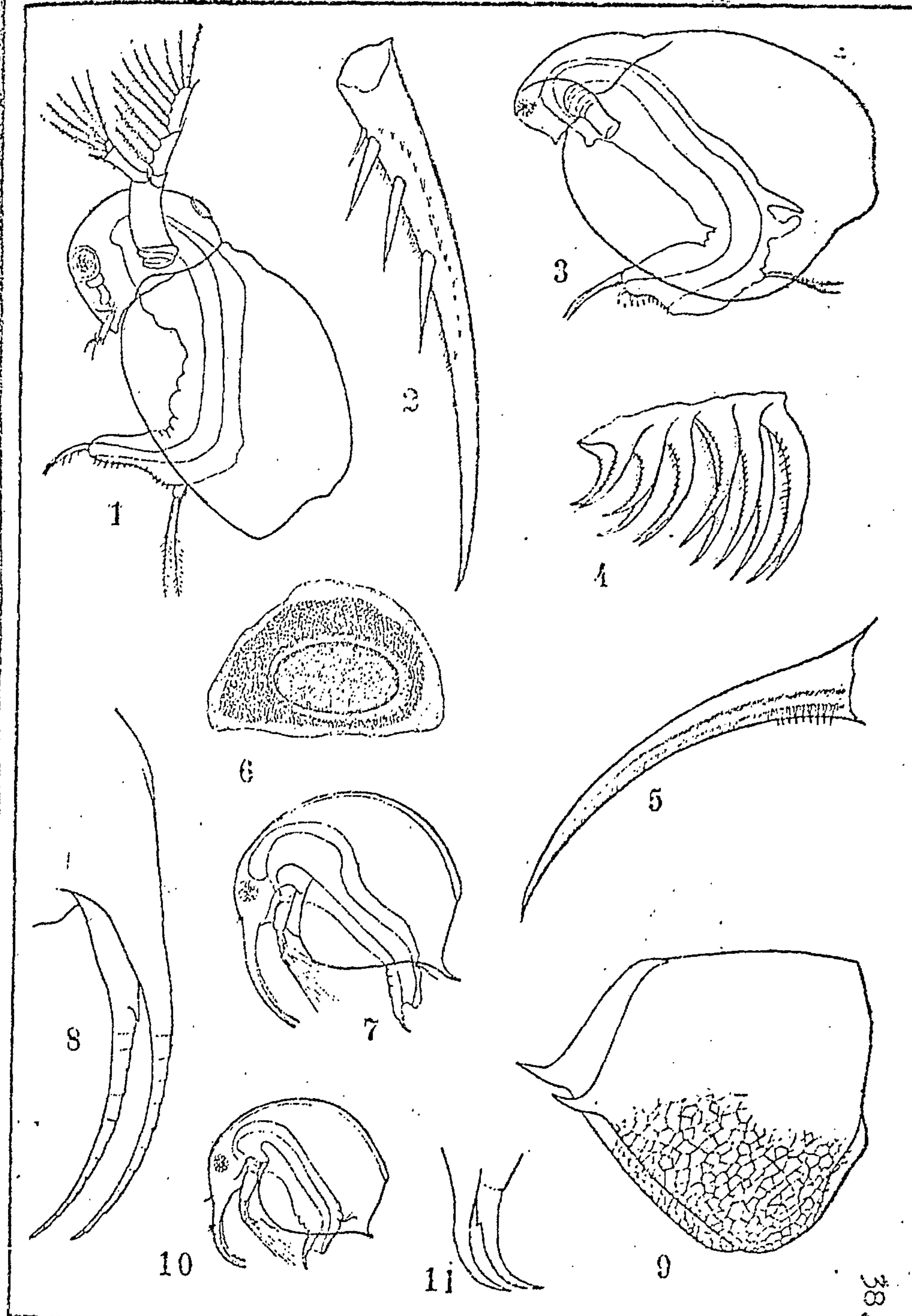

Рис. Л. Россолимо. Gez. L. Rossolimo.

Table I

Fig 1. End claw.

Fig 4. End of back edge of postabdomen.

Fig. 5. End claw.

Fig. 6. Ephippium.

Fig. 8. Antennules.

Fig. 9. Shell.

Fig.11. Antennules.

Table II

Таблица II.

Рис. 1. Bosmina obtusirostris s. str. *G. O. Sars.* [12]
Рис. 2. " " " " Антенна I пары. Ap. 4 mm. C. oc. 4.
Рис. 3. Bosmina obtusirostris var. arctica. *Lilljeborg.* [12]
Рис. 4. " " " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 5. Bosmina longispina s. str. *Fr. Leydig.* [12]
Рис. 6. " " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 7. Bosmina longispina s. str. *F. Leydig.* Постабдомен с концевыми коготками. Ap. 8 mm. C. oc. 6.
Рис. 8. Bosmina coregoni s. str. *Baird.* [12]
Рис. 9. " " " " Раковинка. Ap. 8 mm. C. oc. 4.

Tafel II.

Fig. 1. Bosmina obtusirostris s. str. *G. O. Sars.* [37]
Fig. 2. " " " " I Antennae. Ap. 4 mm. C. Oc. 4.
Fig. 3. Bosmina obtusirostris var. arctica. *Lilljeborg.* [37]
Fig. 4. " " " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 5. Bosmina longispina s. str. *Fr. Leydig.* [37]
Fig. 6. " " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 7. Bosmina longispina s. str. *F. Leydig.* Hinterleib mit dem Endkrallen. Ap. 8 mm. C. Oc. 6.
Fig. 8. Bosmina coregoni s. str. *Baird.* [37]
Fig. 9. " " " " Schale. Ap. 8 mm. C. Oc. 4.

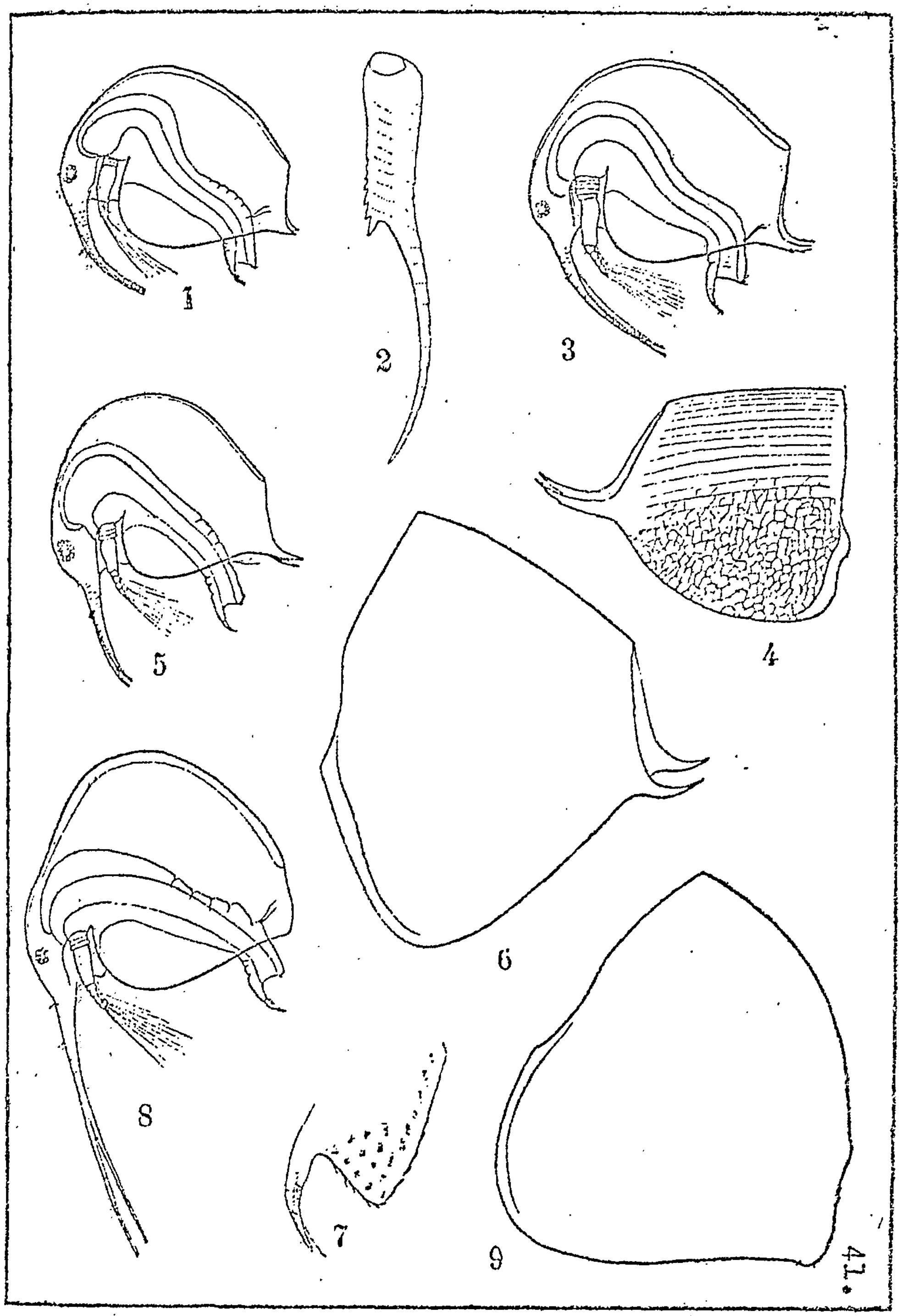

Рис. Л. Россолимо. Gez. L. Rossolimo.

Table II

Fig. 2.	Antennules
Fig. 4.	Shell.
Fig. 6.	Shell
Fig. 7,	Postabdomen with end claws.
Fig. 9.	Shell

TABLE III

Таблица III.

Рис. 1. Drepanothrix dentata (*Eurén*). [12]
Рис. 2. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 3. Drepanothrix dentata (*Eurén*). Постабдомен с концевыми коготками. Ap. 8 mm. C. oc. 6.
Рис. 4. Eurycercus lamellatus (*O. F. Müller*). [13]
Рис. 5. " " " Постабдомен. Ap. 16 mm. C. oc. 4.
Рис. 6. Eurycercus lamellatus (*O. F. Müller*). Антенна I пары. Ap. 4 mm. C. oc. 4.
Рис. 7. Eurycercus lamellatus (*O. F. Müller*). Концевой коготок. Ap. 8 mm. C. oc. 6.
Рис. 8. Camptocercus rectirostris (*Schoedler*). [13]
Рис. 9. " " " Раковинка. Ap. 16 C. oc. 6.
Рис. 10. Camptocercus rectirostris (*Schoedler*). Постабдомен. Ap. 8 mm. C. oc. 6.
Рис. 11. Alonopsis elongata. *G. O. Sars.* [13]
Рис. 12. " " " Раковинка. Ap. 8 mm. C. oc. 6.
Рис. 13. Alonopsis elongata *G. O. Sars.* Часть поверхности раковинки. Ap. 4 mm. C. oc. 6.
Рис. 14. Aponopsis elongata *G. O. Sars.* Постабдомен. Ap. 8 mm. C. oc. 6.

Tafel III.

Fig. 1. Drepanothrix dentata. (*Eurén*). [37]
Fig. 2. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 3. Drepanothrix dentata. (*Eurén*). Hinterleib mit dem Endkrallen. Ap. 8 mm. C. Oc. 6.
Fig. 4. Eurycercus lamellatus (*O. F. Müller*). [38]
Fig. 5. " " " Hinterleib. Ap. 16 mm. C. Oc. 4.
Fig. 6. Eurycercus lamellatus (*O. F. Müller*). I Antennae. Ap. 4 mm. C. Oc. 4.
Fig. 7. Eurycercus lamellatus (*O. F. Müll.*). Endkralle. Ap. 8 mm. C. Oc. 6.
Fig. 8. Camptocercus rectirostris (*Schoedler*). [38]
Fig. 9. " " " Schale. Ap. 16 mm. C. Oc. 6.
Fig. 10. Camptocercus rectirostris (*Schoedler*). Hinterleib. Ap. 8 mm. C. Oc. 6.
Fig. 11. Alonopsis elongata. *G. O. Sars.* [38]
Fig. 12. " " " Schale. Ap. 8 mm. C. Oc. 6.
Fig. 13. Alonopsis elongata. *G. O. Sars.* Oberfläche der Schale. Ap. 4 mm. C. Oc. 6.
Fig. 14. Alonopsis elongata. *G. O. Sars.* Hinterleib. Ap. 8 mm. C. Oc. 6.

Таблица III. Tafel III.

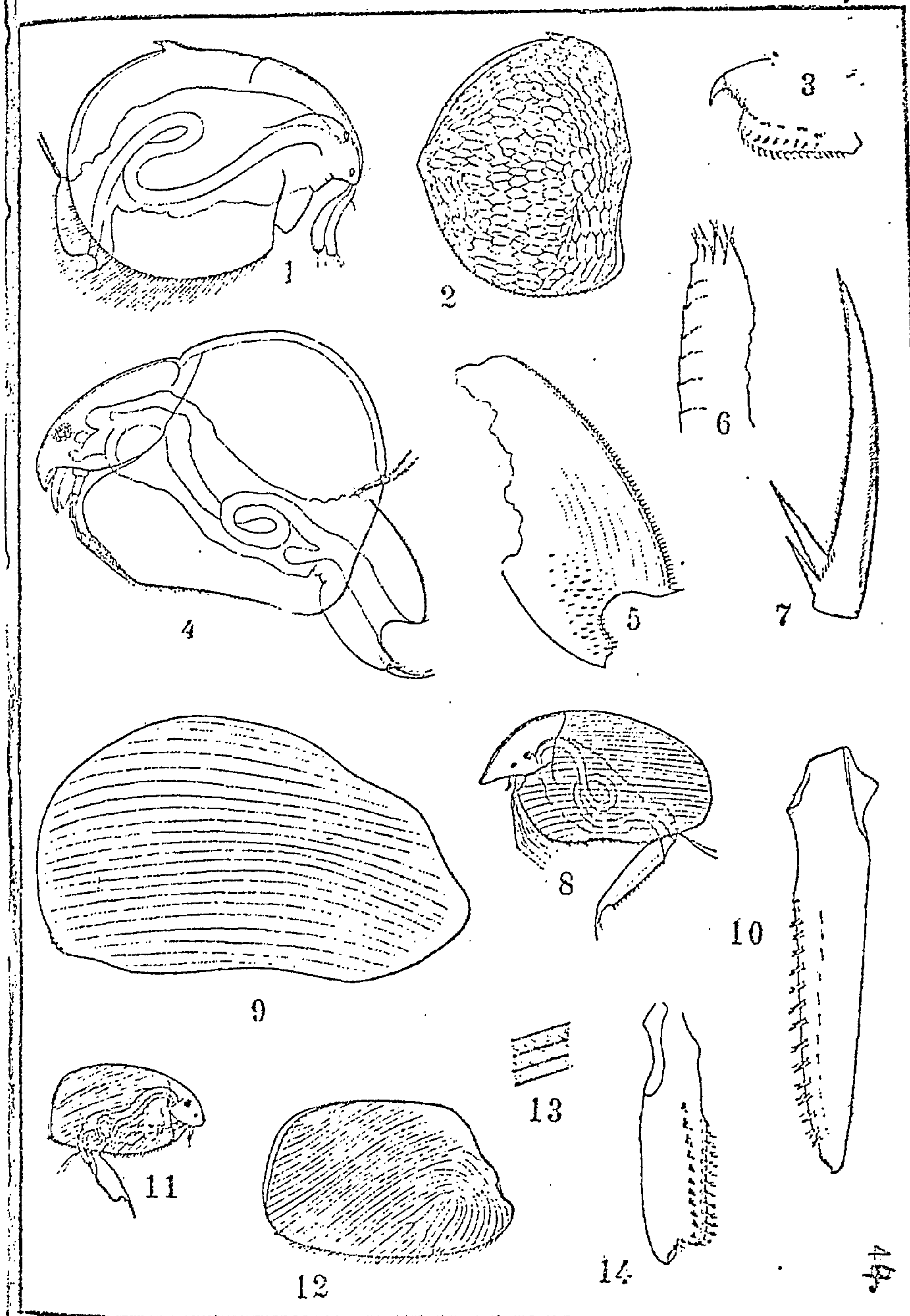

Рис. Л. Россолимо. Gez. L. Rossolimo.

TABLE III

Fig	2.	Shell
"	3.	Postabdomen with end claws.
"	5.	Postabdomen.
"	6.	Antennules.
"	7.	End claws.
"	9.	Shell.
"	10.	Postabdomen.
"	12.	Shell.
"	13.	Part of shell surface.
"	14.	Postabdomen.

TABLE IV

Таблица IV.

Рис. 1. Acroperus harpae. *Baird.* [13]
Рис. 2. " " " Постабдомен. Ap. 8 mm. C. oc. 6.
Рис. 3. Acroperus harpae. *Baird.* Концевой коготок. Ap. mm. 4. C. oc. 6.
Рис. 4. Alona quadrangularis. (*O. F. Müller*). [13]
Рис. 5. " " " Постабдомен. Ap. 8 mm. C. oc. 6.
Рис. 6. Alona quadrangularis. (*O. F. Müller*). Концевой коготок. Ap. 4 mm. C. oc. 6.
Рис. 7. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 8. Alona guttata. (*G. O. Sars*). [14]
Рис. 9. " " " Раковинка, Ap. 8 mm. C. oc. 6.
Рис. 10. Rhynchotalona rostrata. (*Koch*). [14]
Рис. 11. " " " Постабдомен. Ap. 8 mm. C. oc. 4.
Рис. 12. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 13. Graptoleberis testudinaria. (*S. Fischer*). [14]
Рис. 14. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 15. Alonella excisa. (*Fischer*). [14]
Рис. 16. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 17. " " " Постабдомен. Ap. 8 mm. C. oc. 6.
Рис. 18. Alonella nana. (*Baird*). [14]
Рис. 19. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 20. " " " Постабдомен. Ap. 8 mm. C. oc. 6.

Tafel IV.

Fig. 1. Acroperus harpae. *Baird.* [38]
Fig. 2. " " " Hinterleib. Ap. 8 mm. C. Oc. 6.
Fig. 3. " " " Endkralle. Ap. 4 mm. C. Oc. 6.
Fig. 4. Alona quadrangularis. (*O. F. Müller*). [39]
Fig. 5. " " " Hinterleib. Ap. 8 mm. C. Oc. 6.
Fig. 6. " " " Endkralle. Ap. 4 mm. C. Oc. 6.
Fig. 7. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 8. Alona guttata. (*G. O. Sars*). [39]
Fig. 9. " " " Hinterleib. Ap. 8 mm. C. Oc. 6.
Fig. 10. Rhynchotalona rostrata. (*Koch*). [39]
Fig. 11. " " " Hinterleib. Ap. 8 mm. C. Oc. 6.
Fig. 12. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 13. Graptoleberis testudinaria. (*S. Fischer*). [39]
Fig. 14. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 15. Alonella excisa. (*Fischer*). [39]
Fig. 16. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 17. " " " Hinterleib. Ap. 8 mm. C. Oc. 6.
Fig. 18. Alonella nana. (*Baird*). [39]
Fig. 19. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 20. " " " Hinterleib. Ap. 8 mm. C. Oc. 6.

Таблица IV. Tafel IV.

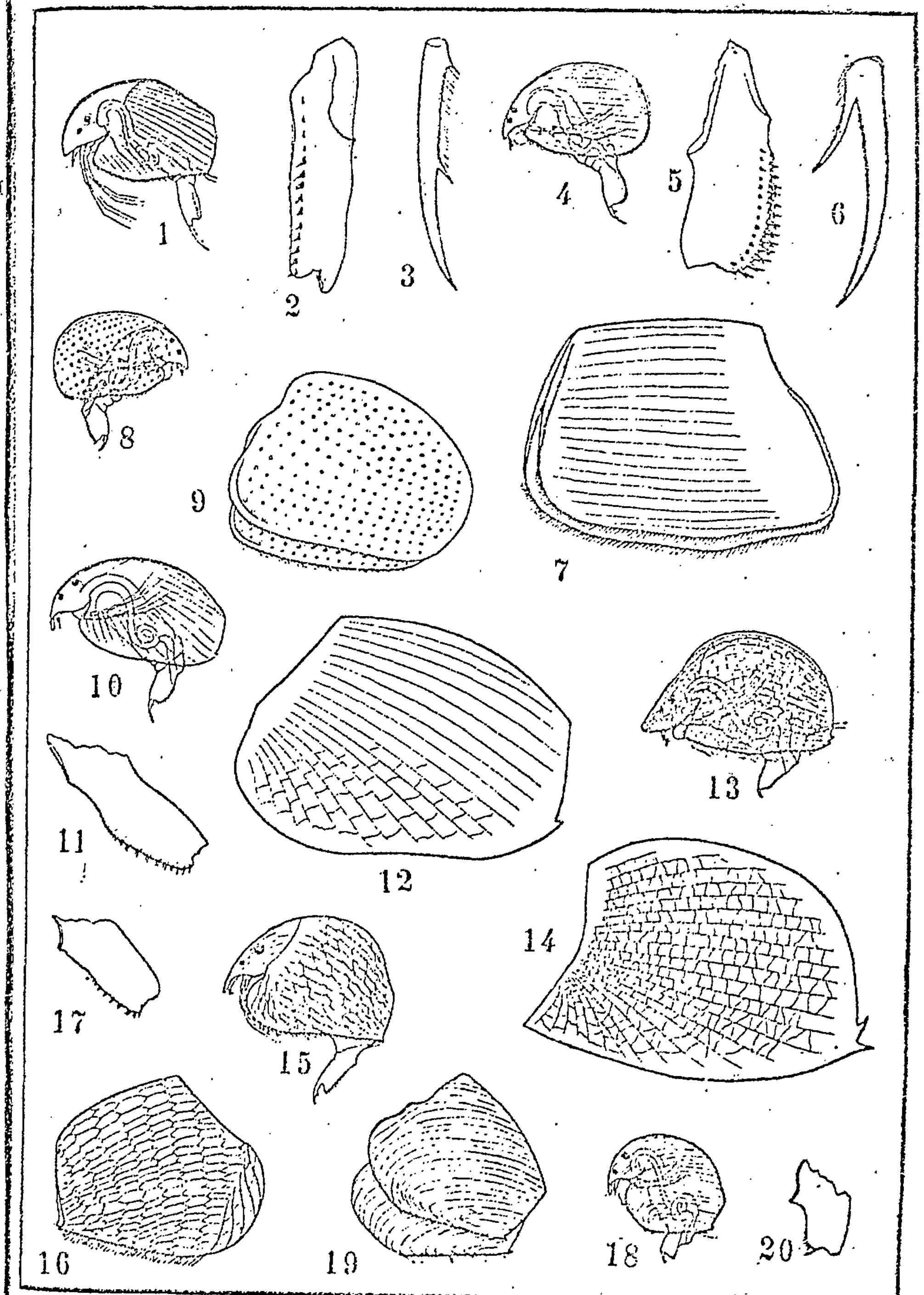

Рис. Л. Россолимо. Gez. L. Rossolimo.

TABLE IV

Fig.	2.	Postabdomen
"	3.	End claw
"	5.	Postabdomen
"	6.	End claw
"	7.	Shell
"	9.	Shell
"	11.	Postabdomen
"	12.	Shell
"	14.	Shell
"	16.	Shell
"	17.	Postabdomen
"	19,	Shell
"	20.	Postabdomen

TABLE V

Таблица V.

Рис. 1. Peracantha truncata. (*O. F. Müller*). [14]
Рис. 2. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 3. Pleuroxus aduncus. (*Jurine*). [15]
Рис. 4. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 5. Pleuroxus aduncus. (*Jurine*). Задний конец раковинки. Ap. 8 mm. C. oc. 4.
Рис. 6. Pleuroxus uncinatus. *O. F. Müll.* [15]
Рис. 7. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 8. Pleuroxus uncinatus. *O. F. Müll.* Задний конец раковинки. Ap. 8 mm. C. oc. 4.
Рис. 9. Chydorus sphaericus (*O. F. Müller*). [15]
Рис. 10. " " " Раковинка. Ap. 8 mm. C. oc. 4.
Рис. 11. Chydorus globosus. *Baird.* [15]
Рис. 12. " " " Раковинка. Ap. 16 mm. C. oc. 4.
Рис. 13. Monospilus dispar. *G. O. Sars.* [15]
Рис. 14. " " " Раковинка. Ap. 8 mm. C. oc. 4.

Tafel V.

Fig. 1. Peracantha truncata. (*O. F. Müller*). [40]
Fig. 2. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 3. Pleuroxus aduncus. (*Jurine.*) [40]
Fig. 4. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 5. Pleuroxus aduncus. (*Jurine*). Unterer hinterer Schalenwinkel. Ap. 8 mm. C. Oc. 4.
Fig. 6. Pleuroxus uncinatus. *O. F. Müll.* [40]
Fig. 7. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 8. Pleuroxus uncinatus. *O. F. Müll.* Unterer hinterer Schalenwinkel. Ap. 8 mm. C. Oc. 4.
Fig. 9. Chydorus sphaericus. (*O. F. Müller*). [40]
Fig. 10. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 11. Chydorus globosus. *Baird.* [40]
Fig. 12. " " " Schale. Ap. 8 mm. C. Oc. 4.
Fig. 13. Monospilus dispar. *G. O. Sars.* [41]
Fig. 14. " " " Schale. Ap. 8 mm. C. Oc. 4.

Таблица V. Tafel V.

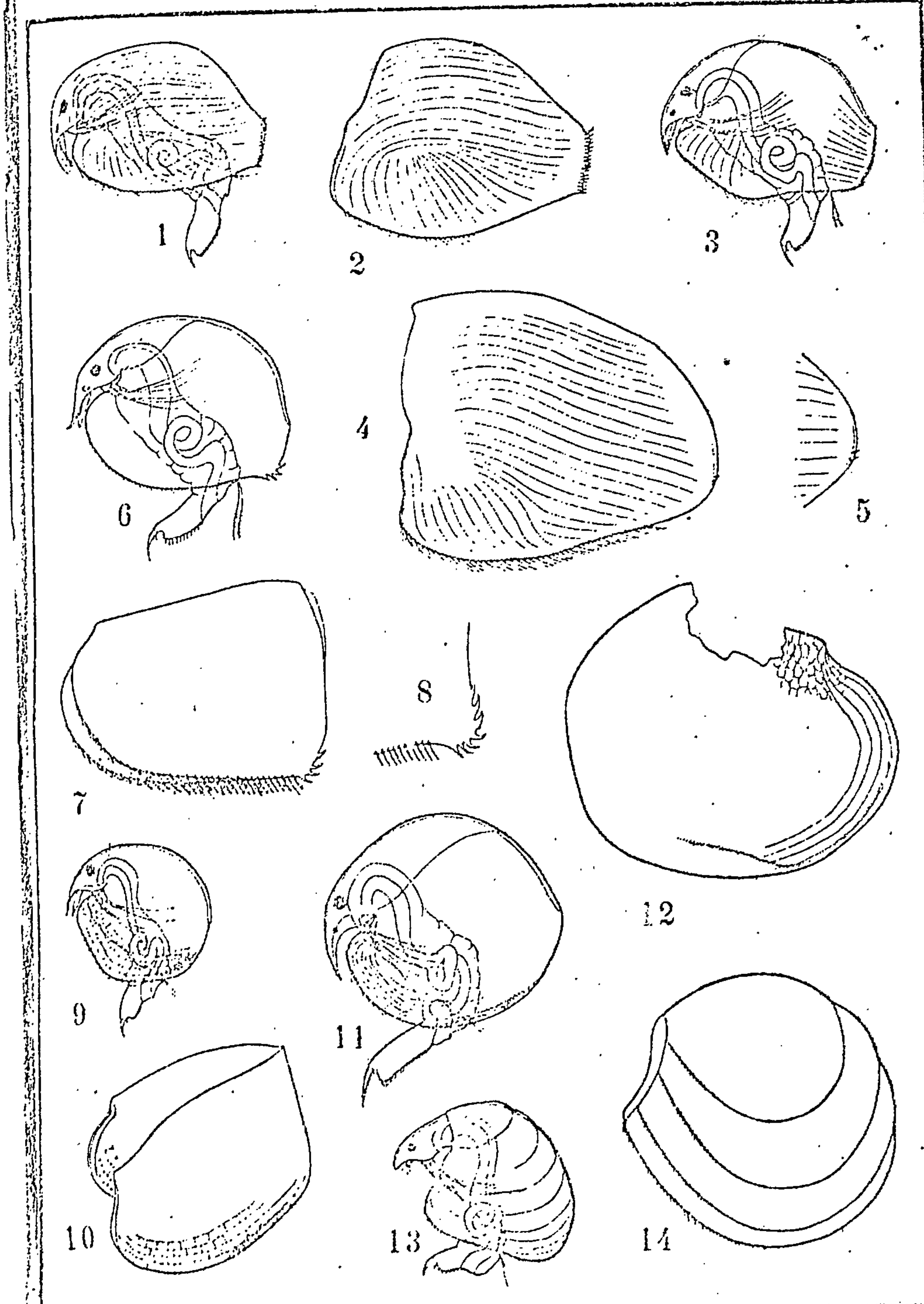

Рис. Л. Россолимо. Gez. L. Rosselimo.

TABLE V

Fig.	2.	Shell
"	4.	"
"	5.	Rear end of shell
"	7.	Shell
"	8.	Rear end of shell
"	10.	Shell
"	12.	Shell
"	14.	Shell

TABLE VI

Рис. 1. Limnadia lenticularis (*L.*). [16]
Рис. 2. „ „ „ Створка раковины. 1 : 25.
Рис. 3. Eurycypris virens. *Jur.* Створка раковины. 1 : 25. [16]
Рис. 4. Cypris pubera. *O. F. Müll.* Створка раковины. 1 : 25. [16]
Рис. 5. Plumatella fungosa. *Pall.* Статобласт. [16]
Рис. 6. Spongilla lacustris (*L.*). Макросклеры. Ap. 4 mm. Comp. oc. 6. [16]
Рис. 7. Spongilla lacustris (*L.*). Микросклеры. Ap. 4 mm. Comp. oc. 6.
Рис. 8. Spongilla lacustris (*L.*). Макросклер, отчасти растворившийся. Ap. 4 mm. Comp. oc. 6.
Рис. 9. Spongilla fragilis *Leidy.* Макросклеры. Ap. 4 mm. Comp. oc. 6. [17]
Рис. 10. Spongilla fragilis *Leidy.* Микросклер. Ap. 4 mm. Comp. oc. 6.
Рис. 11. Ephydatia Mülleri. *Liebk.* Макросклеры. Ap. 4 mm. Comp. oc. 6. [17]
Рис. 12. Ephydatia Mülleri. *Liebk.* Амфидиск. Ap. 4 mm. Comp. oc. 6.
Рис. 13. Carterius Stepanovi *Petr.* Микросклеры. Ap. 4 mm. Comp. oc. 6. [17]

Tafel VI.

Fig. 1. Limnadia lenticularis (*L.*). [41]
Fig. 2. „ „ „ Schale. 1 : 25.
Fig. 3. Eurycypris virens. *Jur.* Schale. 1 : 25. [41]
Fig. 4. Cypris pubera. *O. F. Müll.* Schale. 1 : 25. [41]
Fig. 5. Plumatella fungosa. *Pall.* Statoblast. [41]
Fig. 6. Spongilla lacustris (*L.*). Makrosklere. Ap. 4 mm. Comp. Oc. 6. [42]
Fig. 7. Spongilla lacustris (*L.*). Mikrosklere. Ap. 4 mm. Comp. Oc. 6.
Fig. 8. Spongilla lacustris (*L.*). Makroskler, teils aufgelöst. Ap. 4 mm. Comp. Oc. 6.
Fig. 9. Spongilla fragilis. *Leidy.* Makrosklere. Ap. 4 mm. Comp. Oc. 6. [42]
Fig. 10. Spongilla fragilis. *Leidy.* Mikrosklere. Ap. 4 mm. Comp. Oc. 6.
Fig. 11. Ephydatia Mülleri. *Liebk.* Makrosklere. Ap. 4 mm. Comp. Oc. 6. [42]
Fig. 12. Ephydatia Mülleri. *Liebk.* Amphydisk. Ap. 4 mm. Comp. Oc. 6.
Fig. 13. Carterius Stepanovi *Petr.* Mikrosklere. Ap. 4 mm. Comp. Oc. 6. [42]

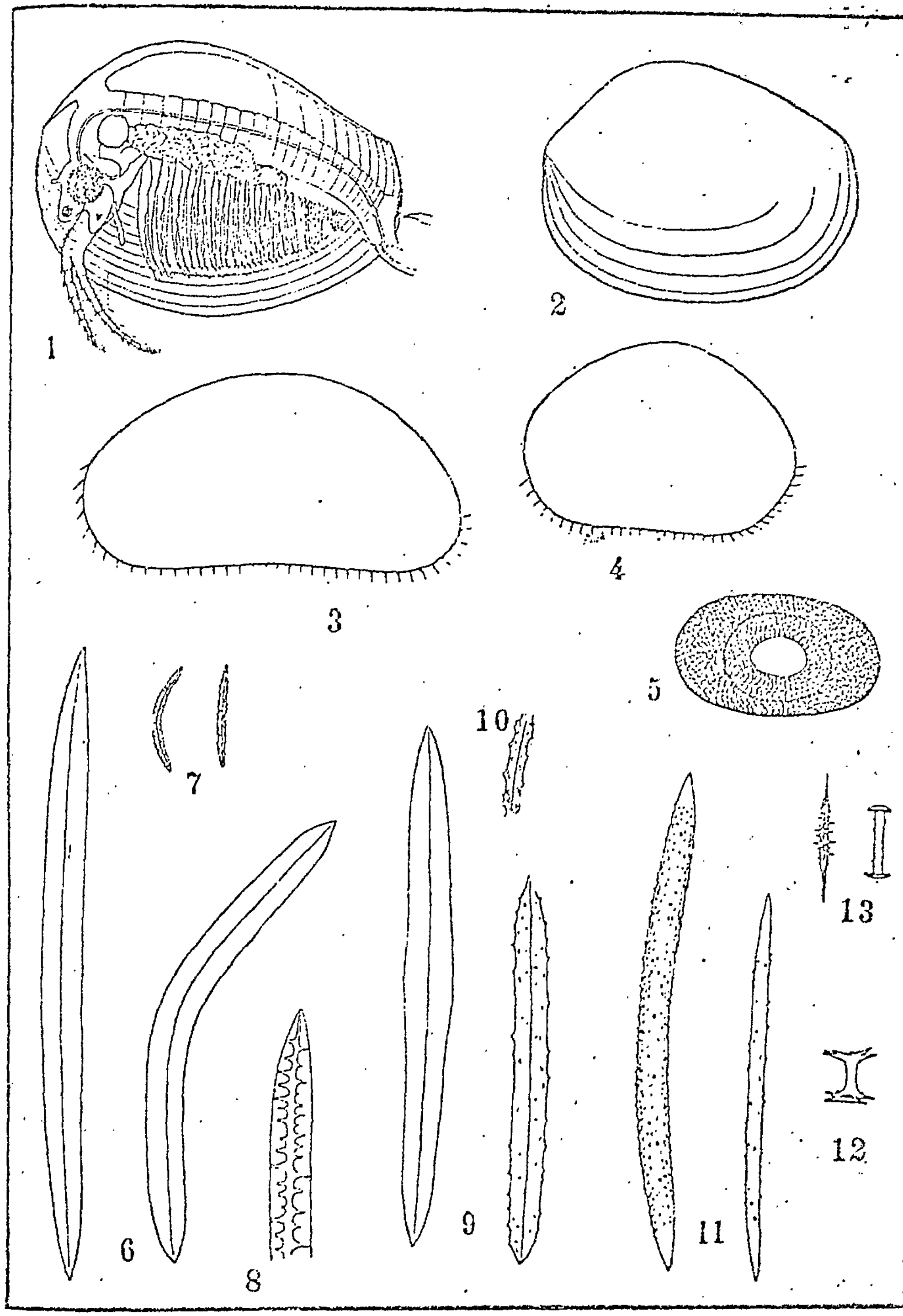

Рис. Л. Россолимо. Gez. L. Rossolimo.

TABLE VI

Fig.	2.	Shell valve
"	3.	Shell valve
"	4.	Shell valve
"	5.	Statoblast
"	6.	Macroscleres
"	7.	Microscleres
"	8.	Macroasclere, partly disintegrated
"	9.	Macroscleres
"	10.	Microsclere
"	11.	Macroscleres
"	12.	Birotulate
"	13.	Microscleres

TABLE VII

Таблица VII.

(Все рисунки этой таблицы сделаны при увеличении в 165 раз).

Рис. 1. Difflugia pyriformis. *Perty.* [18]
Рис. 2. D. pyriformis var. lacustris. *Penard.* [18]
Рис. 3. " " " "
Рис. 4. D. pyriformis var. claviformis. *Penard.* [18]
Рис. 5. D. pyriformis var. nodosa *Leidy.* [18]
Рис. 6. Difflugia capreolata *Penard.* [18]
Рис. 7. Difflugia curvicaulis *Penard.* [18]
Рис. 8. Difflugia accuminata *Ehrenberg.* [18]
Рис. 9. D. accuminata var. inflata *Penard.* [18]
Рис. 10. Difflugia corona *Wallich.* [18]
Рис. 11. Difflugia constricta *Ehrenberg.* [19]
Рис. 12. Difflugia lobostoma *Leidy.* [18]
Рис. 13. Difflugia hydrostatica *Zacharias.* [18]
Рис. 14. Difflugia urceolata *Carter.* [18]
Рис. 15. Difflugia lithoplites *Penard.* [18]

Tafel VII.

(Vergrösserung × 165).

Fig. 1. Difflugia pyriformis. *Perty.* [43]
Fig. 2. D. pyriformis var. lacustris. *Penard.* [43]
Fig. 3. " " " "
Fig. 4. D. pyriformis var. claviformis. *Penard.* [43]
Fig. 5. D. pyriformis var. nodosa. *Leidy.* [43]
Fig. 6. Difflugia capreolata. *Penard.* [43]
Fig. 7. Difflugia curvicaulis. *Penard.* [43]
Fig. 8. Difflugia accuminata. *Ehrenberg.* [43]
Fig. 9. D. accuminata var. inflata. *Penard.* [43]
Fig. 10. Difflugia corona. *Wallich.* [44]
Fig. 11. Difflugia constricta. *Ehrenberg.* [44]
Fig. 12. Difflugia lobostoma. *Leidy.* [44]
Fig. 13. Difflugia hydrostatica. *Zacharias.* [43]
Fig. 14. Difflugia urceolata. *Carter.* [43]
Fig. 15. Difflugia lithoplites. *Penard.* [44]

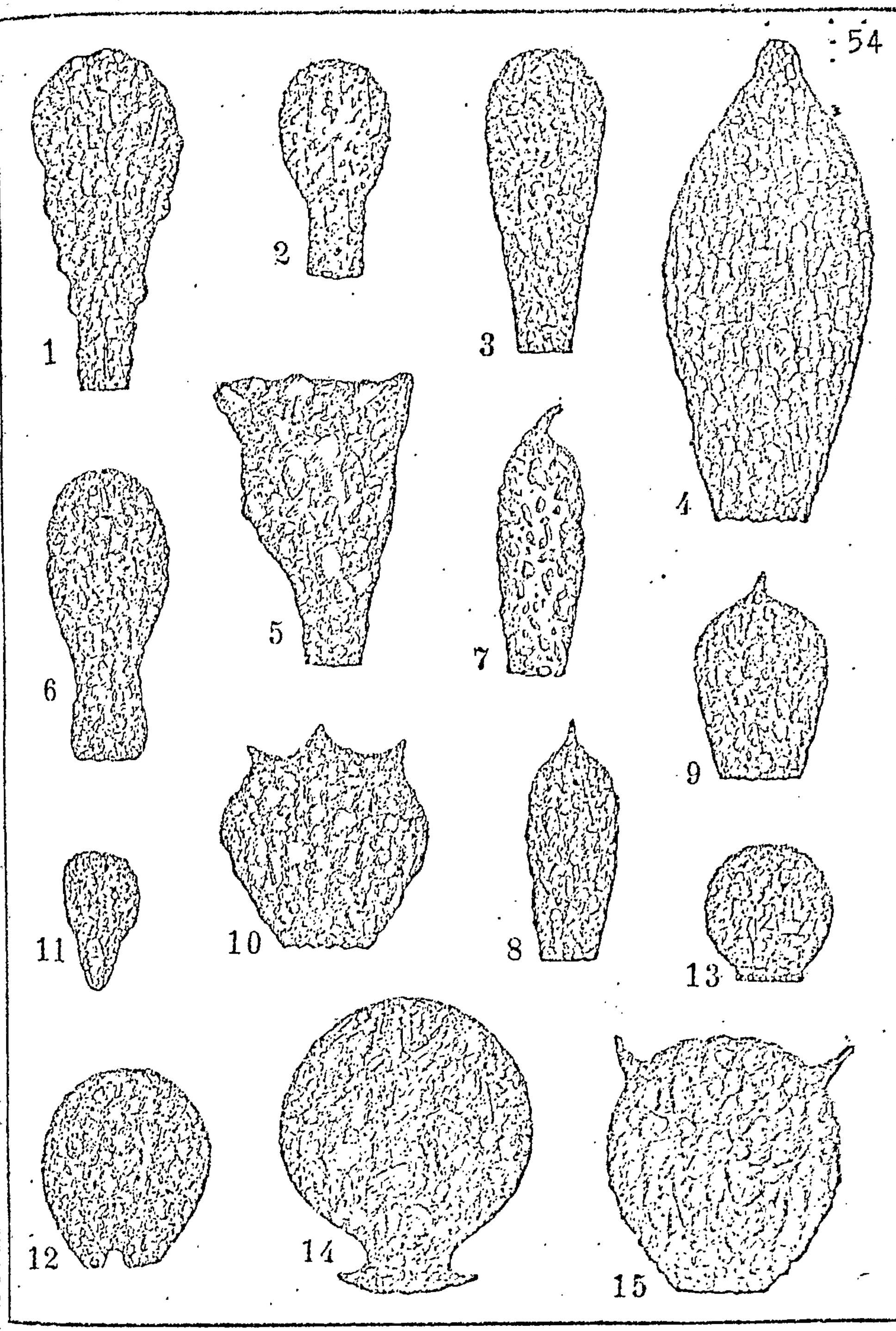

Рис. Л. Россолимо. Gez. L. Rossolimo.

TABLE VII

All illustrations in this table are magnified 165 times.

TABLE VIII

Рис. 1. Difflugia amphora *Leidy.* [19]
Рис. 2. Difflugia globulosa *Dujardin.* [18]
Рис. 3. Difflugia varians *Penard.* [18]
Рис. 4. Difflugia elegans *Penard.* [18]
Рис. 5. Difflugia fallax *Penard.* [18]
Рис. 6. Difflugia bidens *Penard.* [18]
Рис. 7. Difflugia lanceolata *Penard.* [18]
Рис. 8. Difflugia limnetica *Lewander.* [18]
Рис. 9. Centropyxis aculeata *Stein.* [19]
Рис. 10. Lequeresia spiralis *Ehrenberg.* [19]
Рис. 11. Pontigulasia bigibbosa *Penard.* [19]
Рис. 12. Pontigulasia incisa *Rhumbler.* [19]
Рис. 13. Pontigulasia spiralis *Rhumbler.* [19]
Рис. 14. Hyalosphenia papilio *Leidy.* [19]
Рис. 15. Hyalosphenia elegans *Leidy.* [19]
Рис. 16. Nebella collaris *Leidy.* [19]
Рис. 17. Arcella vulgaris *Ehrenberg.* [19]
Рис. 18. Arcella costata *Ehrenberg.* [19]
Рис. 19. Arcella stellaris *Perty.* [19]
Рис. 20. Cyphoderia ampulla *Ehrenberg.* [19]
Рис. 21. Euglipha alveolata *Dujardin.* [19]
Рис. 22. Euglipha cristata *Liedy.* [19]
Рис. 23. Trinema enchelys *Ehrenberg.* [19]
Рис. 24. Ditrema flavum *Archer.* [19]
Рис. 25. Tintinnopsis lacustris *Entz.* [20]

Tafel VIII.

(Vergrösserung × 165).

Fig. 1. Difflugia amphora *Leidy.* [44]
Fig. 2. Difflugia globulosa *Dijardin.* [43]
Fig. 3. Difflugia varians *Penard.* [43]
Fig. 4. Difflugia elegans *Penard.* [43]
Fig. 5. Difflugia fallax *Penard.* [43]
Fig. 6. Difflugia bidens *Penard.* [43]
Fig. 7. Difflugia lanceolata *Penard.* [43]
Fig. 8. Difflugia limnetica *Lewander.* [44]
Fig. 9. Centropyxis aculeata *Stein.* 44
Fig. 10. Lequeresia spiralis *Ehrenberg.* [44]
Fig. 11. Pontigulasia bigibbosa *Penard.* [44]
Fig. 12. Pontigulasia incisa *Rhumbler.* [44]
Fig. 13. Pontigulasia spiralis *Rhumbler.* [44]
Fig. 14. Hyalosphenia papilio *Leidy.* [44]
Fig. 15. Hyalosphenia elegans *Leidy.* [44]
Fig. 16. Nebella collaris *Leidy.* [44]
Fig. 17. Arcella vulgaris *Ehrenberg.* [44]
Fig. 18. Arcella costata *Ehrenberg.* [44]
Fig. 19. Arcella stellaris *Perty.* [44]
Fig. 20. Cyphoderia ampulla *Ehrenberg.* [44]
Fig. 21. Euglipha alveolata *Dijardin.* [44]
Fig. 22. Euglipha cristata *Leidy.* [44]
Fig. 23. Trinema enchelys *Ehrenberg.* [44]
Fig. 24. Ditrema flavum *Archer.* [44]
Fig. 25. Tintinnopsis lacustris *Entz.* [45]

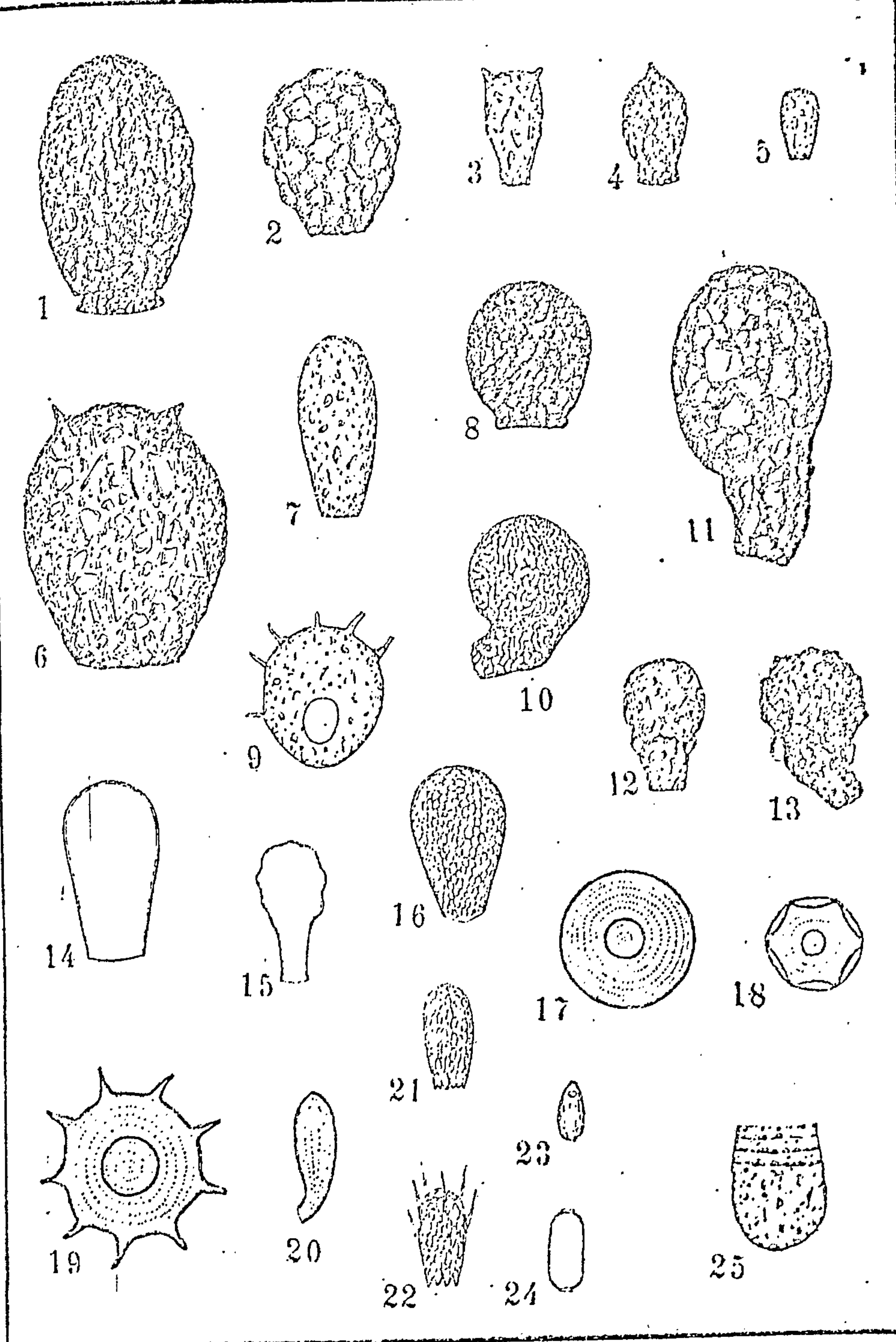

Рис. Л. Россолимо. Gez. L. Rossolimo.

TABLE VIII

(All illustrations in this table are magnified 165 times)

TABLE IX

Таблица IX.

Рис. 1. Limnea stagnalis *L.* 1:2. [21]
Рис. 2. Radix auricularia *L.* lagotis 1:2. [21]
Рис. 3. Radix ovata *Drap.* 1:2. [21]
Рис. 4. R. ovata obtusa *Kob.* 1:2. [21]
Рис. 5. R. ovata fontinalis 1:2. [21]
Рис. 6. Stagnicola palustris *Müll.* 1:2. [21]
Рис. 7. Galba truncata *Müll.* 1:2. [21]
Рис. 8. Coretus corneus *L.* 1:2. [21]
Рис. 9. Spiralina vortex *L.* 1:2. [21]
Рис. 10. Gyraulus albus *Müll.* 1:3,3. [22]
Рис. 11. Gyraulus gredleri *Gredler* rossmaessleri *Auerswald* 1:3,3. [22]
Рис. 12. Batyomphalus contortus *L.* 1:3,3. [22]
Рис. 13. Armiger crista nautileus *L.* 1:3,3. [22]
Рис. 14. Armiger crista cristatus *L.* 1:3,3. [22]
Рис. 15. Segmentina nitida *Müll.* 1:3,3. [22]
Рис. 16. Segmentina nitida distinguenda *Gredler.* 3,3. [22]
Рис. 17. Vivipara vivipara *Müll.* 1:2. [22]
Рис. 18. Bythinia tentaculata *L.* 1:2. [22]
Рис. 19. Valvata piscinalis *Müll.* 1:2. [22]
Рис. 20. Valvata piscinalis var. antiqua *Sow.* 1:2, [22]
Рис. 21. Valvata pulchella *Studer* 1:3,3 [23]
Рис. 22. Valvata naticina *Menke* 1:3,3. [23]
Рис. 23. Valvata cristata *Müll.* 1:3,3. [23]
Рис. 24. Sphaerium corneum *L.* 1:2. [23]

Tafel IX.

Fig. 1. Limnea stagnalis *L.* 1:2. [46]
Fig. 2. Radix auricularia *L.* lagotis 1:2. [46]
Fig. 3. Radix ovata *Drap.* 1:2. [46]
Fig. 4. R. ovata *Kob.* 1:2. [46]
Fig. 5. R. fontinalis 1:2. [46]
Fig. 6. Stagnicola palustris *Müll.* 1:2. [46]
Fig. 7. Galba truncata *Müll.* 1:2. [46]
Fig. 8. Coretus corneus *L.* 1:2. [47]
Fig. 9. Spiralina vortex *L.* 1:2. [47]
Fig. 10. Gyraulus albus *Müll.* 1:3,3. [47]
Fig. 11. Gyraulus gredleri *Gredler* rossmaessleri *Auerswald* 1:3,3. [47]
Fig. 12. Batyomphalus contortus *L.* 1:3,3. [47]
Fig. 13. Armiger crista nautileus *L.* 1:3,3. [47]
Fig. 14. Armiger crista cristatus *L.* 1:3,3. [47]
Fig. 15. Segmentina nitida *Müll.* 1:3,3. [47]
Fig. 16. Segmentina nitida distinguenda *Gredler.* 3,3. [47]
Fig. 17. Vivipara vivipara *Müll.* 1:2. [47]
Fig. 18. Bythinia tentaculata *L.* 1:2. [47]
Fig. 19. Valvata piscinalis *Müll.* 1:2. [48]
Fig. 20. Valvata piscinalis var. antiqua *Sow.* 1:2. [48]
Fig. 21. Valvata pulchella *Studer* 1:3,3. [48]
Fig. 22. Valvata naticina *Menke* 1:3,3. [48]
Fig. 23. Valvata cristata *Müll.* 1:3,3. [48]
Fig. 24. Sphaerium corneum *L.* 1:2. [48]

Таблица IX. Tafel IX.

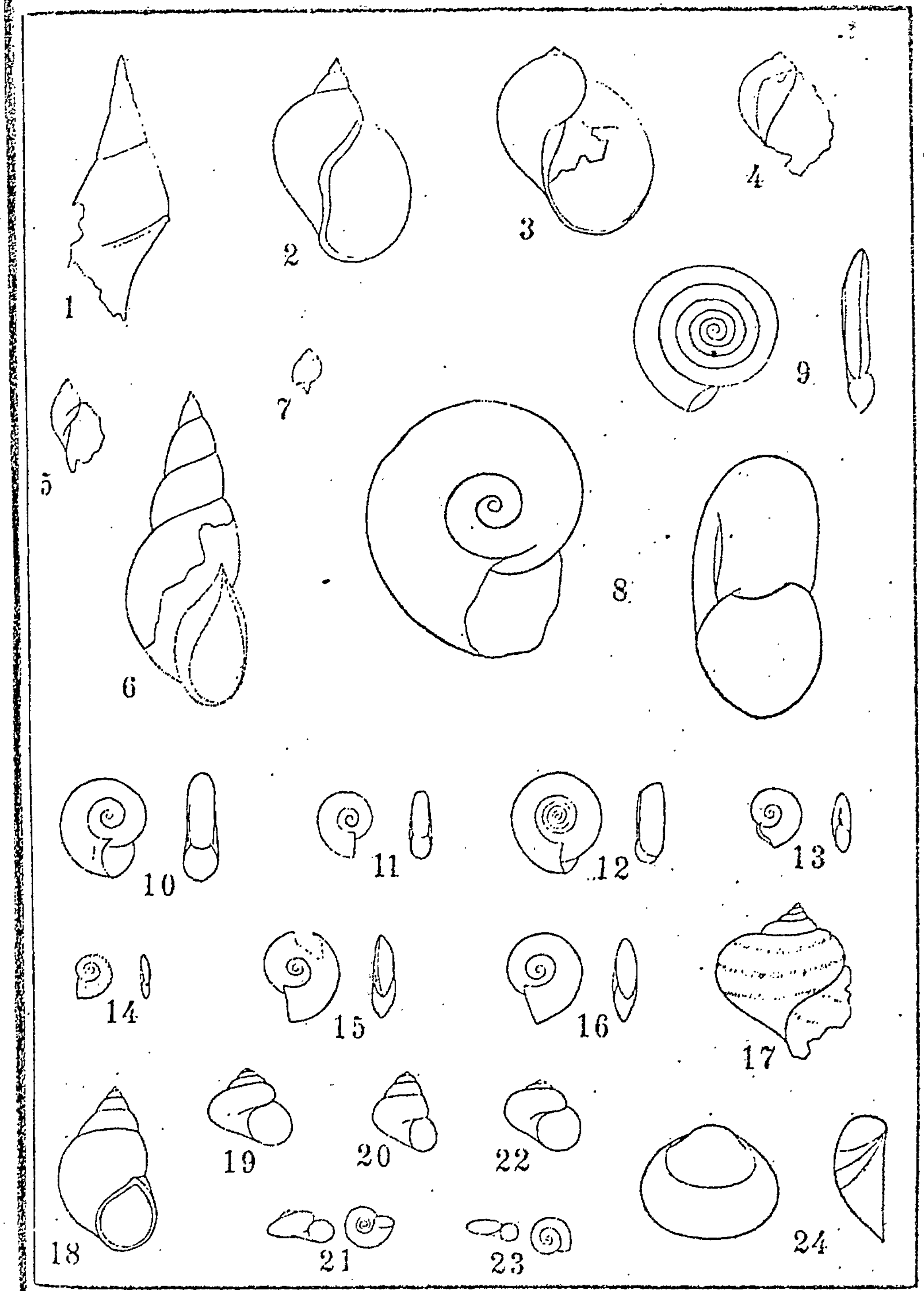

Рис. Л. Россолимо. Gez. L. Rossolimo.