The Twelfth International Congress of Limnology, 1953

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THE Twelfth International Congress of Limnology, the first such congress to be held in Britain, attracted nearly 300 participants, from about 35 countries. It opened on August 20 at Cambridge, England, with an address of welcome by Professor F. E. Fritsch, Chairman of the Council of the Freshwater Biological Association, followed by an address by Dr. Gunnar Alm, President of the International Association of Limnology. At this session, Naumann medals, instituted in 1939 in memory of one of the founders of the International Association, were awarded to Prof. F. Lenz (Plön) and Dr. L. Findenegg (Austria), in recognition of their distinguished services to limnology. On the next evening, Professor U. D'Ancona (Padua) delivered the first Edgardo Baldi Memorial Lecture. Speaking in English, Professor D'Ancona discussed the stability of lacustrine plankton communities, a subject on which Baldi and his collaborators had published numerous researches. A second evening lecture was given by Dr. E. Windle Taylor of the Metropolitan Water Board, London, who described the reservoirs providing the water supply of the metropolis and the means adopted to ensure absence of contamination. Saturday night, Dr. J. W. Jones (Liverpool) showed a cinematograph film of the spawning of salmon, and on the evening of the 24th, films illustrating Canadian and South African fisheries and underwater films of marine fishing gear in operation were shown.

During the scientific sessions, more than 100 papers were read, and it is only possible to refer to a sufficient number of them to indicate the range of topics discussed. Those aspects of limnology which are at present in the forefront of investigation received a wide measure of attention. Bottom sediments were considered from many different points of view. G. E. Hutchinson, in a paper that aroused wide interest, discussed new approaches to their chemistry, dealing with calcium content, carotenoid pigments, and amino acids. E. S. Deevey emphasized, from the biogeographic point of view, the importance of the study of the animal remains within the sediments.

Other speakers dealt with sediments in relation to the productivity of the overlying water. The role played by bacteria at the mud-water interface in the uptake of radiophosphorus was described by F. R. Hayes (Canada), who explained that, while sterile mud exchanges phosphorus throughout its depth, in living mud such exchange is restricted to a surface layer of one millimeter or less; the speaker suggested that artificial increase of the surface of the bottom might be as beneficial as fertilizing the water. The shape of the lake basin as a factor in productivity was also emphasized by D. S. Rawson (Canada), who referred to the inverse correlation between mean depth and standing crops of net plankton in Canadian lakes. The results of monthly estimations and analyses of collected sediment from various Swiss lakes were reported on by E. A. Thomas (Zürich), and H. Järnefelt (Helsinki) described similar data collected in southern Finland. The importance of the phytoplankton in contributing to the sediments in shallow lakes of the Congo was emphasized by H. Dammas (Belgium), and J. Symoens (Belgium) described tufa deposits formed by Chironomid larvae, associated with the blue–green alga *Phormidium incrustatum*. K. Berg (Denmark) discussed the bottom fauna of a humic lake in relation to the bottom deposits, and F. Lenz (Plön) that of the sandy shallow littoral regions of lakes in Holstein, where larvae of Tendipedidae predominate. J. H. Mundie (Windermere) reported on the distribution of Chironomid midges in a Thames reservoir.

Others approached productivity from the point of view of the plankton. W. Ohle, discussing the very rapid eutrophy of many North German lakes, attributed it to soil erosion accompanying intensive agriculture and to the fact that even purified sewage effluents still contribute materially toward mineral enrichment. The probable role of minute and partly heterotrophic green algae in maintaining in subarctic lakes, during the darkness of winter, about as copious a zooplankton as in summer, was discussed by W. Rodhe (Uppsala). G. E. Fogg (London) gave an account of the liberation of polypeptides by algae, which the speaker suggested might be an important factor in productivity. A paper by G. A. Prowse (Sudan) distinguished between production in fish and total biological productivity by the flora as a whole.

Various papers dealt more directly with plankton investigation. J. Rzóska (Sudan) gave an account of that of the White Nile, which gradually reaches a maximum during the accumulation of water in the second half of the year above the dam south of Khartum. J. F. Talling (London) discussed the light relations of the phytoplankton, W. Schmitz (Germany) reported on the occurrence of water flowers in flowing water, and M. Shilo (Israel) described the use of am-

monium sulfate in controlling the growth of the phytoflagellate *Prymnesium parvum,* which is toxic to fish. As regards zooplankton, V. Tonolli (Pallanza) considered the fate of organisms carried into rivers from the surface waters of lakes, while O. Ravera (Italy) and U. Røen (Denmark) dealt with seasonal variation in the reproductive rate of Pelagic Copepods. R. Margalef (Spain) gave an account of the effects of higher temperatures on the morphology of freshwater organisms. From the point of view of methodology, mention may be made of papers by A. A. Aleem (Egypt) on the use of triphenyltetrazolium chloride in the measurement of plankton populations, and of A. van der Werff (Netherlands) on a method of removing organic material from diatoms and other organisms with hydrogen peroxide and potassium permanganate.

Papers that discussed temperature relations and circulation in lakes attracted large audiences. C. H. Mortimer (Windermere) dealt with the influence of the earth's rotation on the internal wave pattern, while B. Dussart (France) gave an account of the effects of inflowing water and sublacustrine springs on thermal stratification and discussed the absorption of solar heat by the surface layers and its nocturnal radiation. The energy transfer between air and water was also considered by H. Charnock (England), who approached it from the meteorological standpoint. H. Neumann (Israel) described the second minimum of evaporation, which occurs during the period of greatest heating in lakes of middle latitudes. Temperature relations in lakes and other waters of Venezuela, Guatemala, and Salvador were likewise discussed in the course of contributions made by F. Gessner (Germany) and E. S. Deevey, the latter also reporting on investigations of photosynthetic productivity in one of the lakes, while K. F. Vaas described how in shallow ponds in Indonesia thermal stratification during the day gives place to an inverse stratification at night as a result of mixing.

R. S. B. Olivier (Argentina) gave an account of regional limnology in the province of Buenos Aires, L. Möller (Germany) discussed the regional distribution of concentration of dissolved substances in Western Germany, and H. E. Klotter (Germany) described a graphic method of recording the environmental factors obtaining during the period of increase of an algal population. E. Teiling (Sweden) dealt with certain stenotrophic algae that may serve as indicators of the trophic standard of a lake.

The distribution of freshwater organisms provided another major topic. S. Stankovič (Yugoslavia) discussed speciation in Lake Ohrid. The representation of species of *Gammarus* in Britain and Scandinavia respectively was reported on by H. B. Hynes (Liverpool) and S. G. Segerstråle (Finland). J. Illies (Germany) emphasized the value of Plecoptera in studies of geographical distribution owing to their restriction to definite temperature ranges and speeds of current. H. K. Mann (Britain) described how the distribution of leeches depends on the total alkalinity, the surface area of a water, and the presence or absence of a current, and A. G. Dahm (Sweden) dealt with *Dugesia tigrina,* a recent planarian immigrant into Europe.

Many papers referred to fish from one point of view or another. C. Kosswig (Turkey) discussed the marine element in the fish fauna of freshwater lakes near the Sea of Marmora. The causes of the lack of success attending the attempted introduction of Salmonidae into French waters were considered by P. Vivier and E. Hubault. J. R. Dymond described the introduction and spread of *Salmo trutta* and *Cyprinus carpio* in Canada, E. G. Calderon dealt with that of pike in Spain, while D. Hey (South Africa) gave an account of the culture of bream and other fish in a sewage effluent. Other speakers discussed factors affecting fish populations. The damage to eggs of char resulting from the winter lowering of the water level in an impounded lake was described by S. Runnström (Sweden). H. D. Slack (Glasgow) reported on factors affecting the survival of *Coregonus* eggs and E. D. Le Cren (Windermere) on those determining survival of perch after hatching.

On the plant side, A. Lundh-Almestrand (Sweden) discussed the distribution of diatoms in Scanian waters in relation to geologic structure, B. Knudsen (Windermere) that of *Tabellaria* in the Lake District, and F. Hustedt (Plön) gave an account of the influence of temperature of solfataras on the diatoms in Salvador. G. Lohammer (Sweden) discussed the introduction of foreign macrophytes.

The applied section devoted a whole day to the discussion of pollution and its effects. O. Jaag (Switzerland) and D. M. Newitt (Britain) dealt with the general aspects, F. T. K. Pentelow and J. R. H. Allan (Britain) with the effects of pollution on the distribution of fish, and R. W. Butcher (Britain) discussed the distribution of organisms characteristic of stages in recovery from pollution. T. Braarud (Norway) gave an account of pollution in the Oslo Fjord, and C. J. Rasmussen described pollution by silage-juices in Denmark. K. Wuhrmann (Switzerland) and D. W. M. Herbert (Britain) discussed the influence of various factors on the toxicity of poisons to fish, H. Jakob and M. Nisbet (France) reported on experiments on the toxicity of ammonium derivatives to algae and fish, and E. Hubault (France) considered toxicity in relation to molecular structure. A. B. Wheatland (Britain) described how in polluted estuaries the formation of sulfides is prevented by slight traces of oxygen, which he attributed to inhibition of the growth of sulfate-reducing bacteria.

Various British workers gave papers on matters concerned with sewage disposal. The correlation between the population of peritrichous ciliates and the quality of the effluent from activated sludge was discussed by S. Baines et al. H. Painter dealt with the factors affecting the growth of Fungi in percolating filters, and T. G. Tomlinson considered means of controlling their growth. The use of effluents in German

agriculture was described by E. Weise, while H. Husmann reported on recent methods of purification of effluents adopted in Germany. L. A. Allen (Britain) described a new method of estimating the numbers of faecal bacteria in a sewage effluent and commented on their rapid decrease, which cannot be accounted for by dilution.

Problems of water supply occupied another day. E. Windle Taylor and A. T. Palin (Britain) discussed chlorination. A. Guelin (France) spoke on the role of bacteriophage in self-purification, while J. Wautier (France) reported on experiments demonstrating the importance of the biologic film in sand filters in retaining *B. coli*. E. Mercier (Switzerland) described improvements in the water of an eutrophic lake resulting from artificial subsurface aeration during the summer stagnation period. A. Ruttner-Kolisko (Austria) spoke on the use of limnological methods in the investigation of potable waters.

The final session of the Congress was held at Windermere on the evening of August 30. The present officers of the International Association of Limnology having intimated their desire to be relieved of office, Professor F. E. Fritsch (Cambridge) was elected President and Dr. T. T. Macan (Windermere) General Secretary. A proposal to send greetings to the American Society for Limnology and Oceanography was adopted with acclamation.

A small party led by Professor J. E. G. Raymont, starting from Southampton, visited the rivers Avon and Test and inspected the work carried out by the University's Department of Zoology near Brockenhurst in the New Forest, prior to the commencement of the Congress. During the days spent at Cambridge visits were arranged to the National Trust's preserve at Wicken Fen, the sewage disposal works at Luton, and the Water Pollution Research Laboratory at Garston, while August 23 was devoted to a whole-day excursion to the Norfolk Broads. The journey from Cambridge to Windermere, occupying three days, was made by coach, during which several British rivers and large sewage works were inspected. One of the two days at Windermere was spent at the laboratory (Ferry House) of the Freshwater Biological Association (Director: H. G. Gilson) and at the Association's experimental hatchery and fish ponds at Wraymires, while the other was devoted to tours in the Lake District. After the termination of the Congress, about 100 of the members spent four days in Scotland, proceeding as far north as Inverness and returning via Loch Ness and Fort William to Glasgow. This tour afforded opportunity of inspecting the Glasgow University Field Laboratory on Loch Lomond under the guidance of Dr. and Mrs. Slack, the Brown Trout Research Laboratory of the Scottish Home Department at Pitlochry at the invitation of the Director, Dr. K. A. Pyefinch, and the adjacent Tummel-Garry hydroelectric installations. A small group afterwards proceeded on a seven days' excursion into Ireland.

Although many participated in the work of preparation, the Congress owes much of its undoubted success to the labors of the Honorary Secretary, C. H. Gilson.

Cole Coolidge: 1897-1953

E. K. Bolton

IN preparing an obituary notice about the late Cole Coolidge, it is not possible to write in cold biographical terms. Our relationship over the twelve-year period in which he was assistant director of the Chemical Department, and indeed after he became director in July 1951, was that of close friendship as well as business association, and the feeling of personal loss in his tragic and untimely death following a relatively minor operation disposes me to write more in terms of his character and abilities than in mere terms of positions held and research developments to which he contributed.

Yet I remember well the astringent wit that he brought to bear on those who sought to praise him, and I know that his preference would be for a simple and factual recital of his career. This memorial will seek to steer a course that appraises the man with all possible objectivity.

A research man with a real talent for administration is likely to be marked at an early stage, as the blend of the researcher's temperament with the ability of the administrator is one not often found. Dr. Coolidge demonstrated an outstanding gift in this field early in his Du Pont career, and it is not surprising that after a very few years his feet were set upon the path that led, in 1926, to his appointment as a group leader and, a few months later, as assistant director of the Experimental Station.

Equally logical was the selection of Dr. Coolidge as assistant director of the Chemical Department in 1939, and his selection by the top management of the company to the directorship of the department. In this capacity he carried a big responsibility, as the Chemical Department serves the entire Du Pont Company through fundamental and long-range research in organic, physical, and inorganic chemistry, and physics. Its work is carried out in close cooperation with the research divisions of the ten manufacturing departments, for which it also undertakes long-range studies in many fields of applied research