DENTAL HYGIENE AND FLUORIDATION OF WATER

N EARLY fifty years ago two American dentists directed attention to a condition of the teeth, characterized by unsightly mottling of the enamel, which occurred in the inhabitants of certain well-defined areas. The cause of this abnormality was later shown to be the presence of fluoride in the drinking water, the topographical distribution of cases being due to variations in naturally occurring fluorides in the water in different localities. Lesions occurred only in persons who had been exposed as children to fluoride-containing water and did not occur in adults who had passed their childhood elsewhere. The proportion of persons affected, and the extent of the lesions, were shown to vary directly with the concentration of fluoride in the water. Later, it was found that though the enamel could be so severely affected that the teeth appeared to be quite badly damaged, they were at the same time much less susceptible to dental caries than were normal teeth. These findings were confirmed in many subsequent investigations, and it has now been established that concentrations of fluorine salts of more than 1.0 part per million in drinking water may lead to the appearance of enamel lesions and also to increased resistance to caries. At this level, however, the lesions are minimal and very few persons are affected. With increasing concentrations the lesions become more pronounced and more members of the population show them. Nevertheless, the resistance to caries which was found to be associated with the presence of very obvious lesions is still present when the level of fluorides in the drinking water is so small that only very occasional lesions of minimal proportions occur in a few people. Investigations in the United States have shown that the degree of this resistance is such that children born and brought up in areas with 1.0 p.p.m. of fluoride occurring naturally in the water have up to 60 per cent less dental caries than children brought up in areas where there is only a trace of fluoride in the water.

Further investigations in the United States and Canada showed that the addition of fluoride to water sufficient to raise the fluoride content to 1.0 p.p.m. had the same effect on the incidence of dental caries as water with naturally occurring fluoride. As a result of these findings, a British mission to the United States and Canada in 1952 recommended that fluoride should be added to the water supplies of selected communities in the United Kingdom, as

a pilot study. The Ministry of Health report, *The Conduct of the Fluoridation Studies in the United Kingdom and the Results Achieved after Five Years**, now gives the results of these investigations carried out in Watford, in part of Anglesey and in Kilmarnock. Andover was originally designated as a fourth study area; but fluoridation was discontinued by the local authority after two years.

The report gives details of the carefully controlled investigations which have now been in progress for five years. Only the findings for the deciduous teeth of children aged 3-7 years are given, since the full effect of fluoride is only exerted when it is absorbed continuously during the whole period of tooth formation and calcification. The data show that whereas prior to fluoridation in 1955-56 children aged three years had on average 3.80 carious teeth, the figure for this age in 1961 was 1.29. The corresponding figures for four-year-old children were 5.39 and 2.31, and for five-year-old children 5.81 and 2.91. These figures represent reductions of caries incidence of 66 per cent, 57 per cent and 50 per cent respectively. There was also a reduction of incidence of caries in the control areas, but only in the region of between 2 and 7 per cent. In children of six and seven years, some of whose teeth were already calcified before fluoridation commenced, the reduction of caries was of a lesser degree.

In addition to these striking figures, the report deals with the question of the safety of fluoridation and also gives some details of the technical problems involved in the fluoridation of public water supplies. With regard to possible toxicity, the fullest investigation of all available evidence has been made and it is concluded that no harm results from raising the fluoride content of drinking water to 1.0 p.p.m. This agrees with the opinion of the World Health Organization's Expert Committee which, after examining the evidence, concluded that: "All these findings fit together in a consonant whole that constitutes a great guarantee of safety—a body of evidence without precedent in public health procedures".

This century has witnessed many triumphs of preventive and curative medicine. It is clear that this short report embodies yet another. R. B. LUCAS

* Ministry of Health: Scottish Office; Ministry of Housing and Local Government. Reports on Public Health and Medical Subjects No. 105: *The Conduct of the Fluoridation Studies in the United Kingdom and the results achieved after five years*. Pp. iii+60. (London: H.M. Stationery Office, 1962.) 4s. net.

ICARUS

A NEW journal, entitled *Icarus*, has recently been published*. It is yet another of those intended to serve a part of that enormous new field of scientific activity popularly known as 'space research'. According to the editors it is to deal with "the new inter-

disciplinary science of the solar system—which is emerging to claim its own identity at the cross-roads of the allied disciplines of astronomy, geology, geophysics, meteorology, geochemistry, plasma physics, and biology". Their aim is "to make a positive contribution to the cause of scientific communication in three distinct ways:

"(a) by a selective concentration of subjects which would otherwise have appeared in a variety of widely scattered scientific periodicals to establish a large-

* *Icarus*, Vol. 1, No. 1 (May 1962). International Journal of the Solar System. Edited by Z. Kopal and A. G. Wilson. Pp. 93. Subscription rates (Vol. 1, 6 issues): Institutional subscribers, 18 dollars; Private subscribers certifying that the journal is for personal use, 10 dollars. (New York and London: Academic Press, Inc., 1962.)

signal, low-noise channel for information on most scientific aspects of the solar system;

"(b) by minimizing delay between the receipt of a communication and its publication to effect the promptness of communication essential in a so rapidly developing field of science;

"(c) by inclusion of a bibliographical section covering all fields of interest to investigators of the solar system to ease the task of monitoring the information".

There are 35 associate editors, most of whose names are already well known. Their function is to collect papers and also to act as referees. It remains to be seen whether this arrangement will prove more successful than that of anonymous referees, whom we all find reasonably efficient in dealing with the papers of other authors, although so tiresome with our own.

Fantastically great resources are at present being devoted to space research; but most of the effort is still being channelled into elaborate and lengthy preparations for difficult experiments, of which comparatively few have yet had time to produce results. If all goes according to plan, ultimately, the amount of new material to be published and discussed may be very great. But so far, relative to the scale of the effort, the volume of results to reach the stage of publication is small (although this is not to minimize their significance). Clearly, *Icarus* has been started in the expectation of taking part in the harvest; but in common with other similar journals it must, for the present, rely chiefly on papers that could equally well have appeared in one or other of half a dozen existing periodicals. This at least seems true of *Icarus*, 1, No. 1. It contains a long paper by A. G. W. Cameron discussing the problem of the formation of the Sun and planets, and three much shorter papers on the interplanetary medium, on the behaviour of photoelectrons emitted by solid bodies such as the Moon, and about the blue haze on Mars. There is also a letter discussing toroidal oscillations of the Moon.

Science is to-day more than ever in danger of sharing the fate of the Tower of Babel. However, the editors of *Icarus* believe that continued progress can be ensured by the formation of fresh, specialized sub-groups, each drawn from a fairly wide field of

existing studies and provided with its own specialized journals. This kind of approach is not exactly new; it has been fruitful in the past and perhaps it promises better than any other. We are in a period of excessively rapid change in astronomy and in every other science connected with space research, affecting theories, instrumentation, administration, and ideas of all kinds, so that it is very difficult to say with confidence what policies are wisest. But so far as publications are concerned, I question whether existing journals are so overloaded that they cannot absorb comfortably all the papers on astronomy likely to result from space research for at least two or three years yet. By then we may be able to see the needs of the situation more clearly.

The financial problems of existing journals are not negligible, and the extra support of space research papers, should it lead to a greater circulation, as it probably would, might in most cases be very welcome. Further, I think it important that space research workers should know what is going on in the older astronomy, and that equally the older kind of astronomer should get to know about space research. Ten or fifteen years ago, after some initial fumbling, radio and optical astronomers discovered that they were better off together than apart, and now to a large extent publish their papers together in the same journals. I hope that this kind of development will come about in the case of astronomy conducted with rockets, artificial satellites, etc.

As to rapidity of publication, the average interval between receipt of manuscript and publication is slightly greater in *Icarus*, 1, No. 1, than in *Monthly Notices of the Royal Astronomical Society*, 124, No. 1, also dated May 1962, a journal now 135 years old, which still manages to cover most of astronomy at a satisfactory level of originality and technical quality.

The bibliography mentioned by the editors include 349 papers in this issue, the great majority from astronomical journals. They are classified, but no abstracts are given. Policy for this section of *Icarus* is still fluid, and one must wait for further issues before being able to judge whether there will be a distinctive service not yet provided by existing abstracting journals.

R. O. REDMAN

PLANNING NEW COMMUNITIES IN BRITAIN

THE report of the Carnegie United Kingdom Trust for 1960 gave some account of the study of the social problems of new communities in Britain which Dr. J. H. Nicholson had made at the request of the Trust and of the National Council for Social Service, and stated also that the Trust had set aside £100,000 in the new quinquennium, which opened in 1961, in order to promote pioneer projects in the provision of social amenities in new communities. The Trust has also appointed an Advisory Committee to consider applications, and where appropriate, to initiate action. Up to the end of 1961 no project, however, had been brought to the point of qualifying for a grant from this fund, practically all failing to measure up to the required standard of innovation. The fund is reserved for assisting work that is now on a national scale, and the Trust is prepared to wait for the right projects.

It is hoped that by the end of 1962 a pattern of expenditure will be planned which will provide assistance for promising projects in one or more of each type of new community in different geographical regions.

Dr. Nicholson's report was published in August 1961*, and the importance attached by the Carnegie United Kingdom Trust to this work is well indicated by the fact that in its report for 1961† the Trust includes Dr. Nicholson's general recommendations *in extenso* as well as those on social development. His report is concerned with the new communities

* *New Communities in Britain: Achievements and Problems*. By J. H. Nicholson. Pp. 191. (London: The National Council of Social Service, Inc., 1961.) 10s. 6d.

† The Carnegie United Kingdom Trust. 48th Annual Report, 1961. Pp. vii+76. (Dunfermline, Fife: The Carnegie United Kingdom Trust, 1962.) (See also *Nature*, 195, 338; 1962.)