



Fig. 7

The finger print test was also applied successfully in a case of congenital ectodermal dysplasia of the anhydrotic type, attributed to the protracted action of fluorine on the pregnant mother¹.

Observation of the prints of a person suffering from a tubercular spine showed that with the progress of the disease the papillary ridges had atrophied to knife-edge dimensions.

Further investigation will be needed before any definite conclusions can be arrived at, but it is suggested that a prolonged scientific analysis of finger prints would, in some cases, supply evidence of incipient disease and of its progress. Owing to the prejudice which still lingers against the taking of finger prints, no matter for what purpose, it is unfortunately not easy to obtain them from the subjects who may prove of interest.

I wish to express my sincere thanks to Dr. W. Howlett Kelleher, physician superintendent of the Western Hospital, Fulham, London, S.W.6, for his assistance and permission to obtain finger prints from a patient under his care, and to Dr. Isaac Jones and Dr. Leo Spira for their helpful advice and interest.

¹ *Acta Med. Scand.*, Stockholm, 127, 570 (1947).

FORESTRY IN WATER CATCHMENT AREAS*

THE necessity for protecting the raw water from pollution in a water-supply catchment area, even with the provision of adequate mechanical filtration, demands close supervision of human activities and land utilization. The report of an official committee appointed in recent years to inquire into this¹ recommended that, subject to the existence of adequate filtration and measures for the disposal of sewage, land in catchment areas should be put to the utmost agricultural use. This recommendation is understandable in view of the considerable acreage of land taken up by water-supply catchment areas and the way in which agricultural land in Great Britain at the present day is being lost to production. At the same time, the factors of the

* Substance of a symposium in Section K* (Forestry) of the British Association, held at Birmingham on August 31. Papers were read by R. Mansell Prothero, D. Lloyd, A. T. A. Learmonth and A. E. Fordham.

physical landscape—altitude, climate and soil—are often unfavourable for agriculture, and in these instances the committee recommended that the land should be afforested, bearing in mind the requirements of adjacent agriculture.

A recent survey of the progress of afforestation in twenty-eight of the larger water-supply catchment areas in Britain reveals a very dismal picture. In only one is 20 per cent of the area afforested, and thirteen have no land under forest. The factors producing this situation are not hard to find. In a minority of instances, industrial pollution, particularly of the atmosphere, prevents successful growth. The cost of planting and tending the forest, with little immediate return for capital outlay, makes afforestation economically difficult. But the most important retarding factor is the problem of ownership. Only seven of the twenty-eight authorities own the whole of their catchment area, a further five own more than 50 per cent and eight own 20 per cent or less of their land. This lack of ownership prevents the complete control of activities within the catchment area. The Corporation of Birmingham in its catchment area in the Elan Valley has to observe commoners' rights, allowing them to control the surface of the ground but not to break it. The freehold areas that have been afforested in the Elan Valley since 1916 have been a financial loss, caused to a large extent by the depreciation of money values during the period in which the timber has been growing.

Economic difficulties of planting are being overcome by agreements made between water undertakers and the Forestry Commission, the former leasing land for future planting. Where absence of ownership prevents afforestation, there is obvious scope for the Forestry Commission to exercise its right of acquisition in preference to some of the suggested acquisitions of good sheep-farming land which have been made in recent months.

With the progress of afforestation so retarded, it is obvious that it is not yet possible in Great Britain to determine the effect of tree-cover on run-off, flooding, erosion and silting. In any event there is a lamentable lack of accurate and scientific record of stream flow and run-off. In the Lake Vyrnwy catchment area, with 20 per cent afforestation, there is no positive evidence of tree-cover either increasing or decreasing the run-off.

The absence of interest in recording stream-flow and run-off is probably due to the generally 'average' climate conditions in Britain, particularly the relatively few instances of rainfall of high intensity. However, when this does occur—as it did over a wide area in south-east Scotland and north-east England on August 12, 1948—the damage caused can be very considerable and with total costs running into several millions of pounds. Such conditions would certainly not be aggravated, and are far more likely to be alleviated, by the presence of tree-cover. A favourable influence would doubtless be exercised on reservoir silting. This is a long-term process; but in eleven out of the twenty-eight authorities it will become serious in reducing reservoir capacity within the next hundred years. The capacity of Abbeystead reservoir of the Lancaster Corporation has been reduced from 185 million to 100 million gallons since its construction in 1872.

In many of the catchment areas of Britain, peat deposits in the upper parts play an important part in decreasing run-off and maintaining dry-weather

flow by absorbing rainfall. It is necessary to remove peat before planting, and it would have to be considered, if this were done on a large scale, what effect it would have on increasing the run-off before the trees reached a stage of development when they might take over the function formerly fulfilled by the peat.

In catchment areas where there is a considerable area of land at more than 1,500 ft. and therefore possibly unsuitable for tree-planting, there might be an effective combination of forestry and sheep farming. The land above this altitude might be used as summer pasture, the sheep being brought down to lower altitudes in the winter through sheep-walks left in the forest, provided that convenient winter pasture could be found outside the catchment area. On the other hand, it has been suggested that flooding on the Rivers Usk and Severn in recent years has been accentuated by increased run-off from the hills due to hill-draining. The latter might be necessary for successful sheep-farming in reservoir catchment areas, and its effect in increasing run-off would work in opposition to forest planted to control it.

Apart from the general suitability of forest as a form of land use in water-supply catchment areas, there is a need for positive evidence to be collected of its influence on run-off and stream flow and therefore on flooding, erosion and silting. Until more forest has been planted and many years have been given to such experiments in order to provide the necessary long-term averages, it will only be possible to make generalized statements and to draw on results and data from other parts of the world, where often environmental conditions and factors at work are very different from those in Great Britain.

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¹ Report of the Gathering Grounds Sub-Committee of the Central Advisory Water Committee. Gathering Grounds; Public Access, Afforestation and Agriculture. (London: H.M. Stationery Office, 1948.)

PRESENT POSITION OF THE THEORY OF CONTINENTAL DRIFT

IF the size and lively interest of the audience is any measure in such matters, the joint discussion held on September 1 during the recent Birmingham meeting of the British Association between Sections C (Geology), D (Zoology), E (Geography) and K (Botany), on "The Present Position of the Theory of Continental Drift", was a very successful one.

The principal contributors numbered eight, namely, Dr. J. R. F. Joyce and Prof. J. H. F. Umbgrove on the palaeogeographical side; Prof. R. D'O. Good and Dr. H. E. Hinton speaking for the botanists and zoologists respectively; Prof. H. Jeffreys and Prof. S. W. Wooldridge representing the geophysicists and geomorphologists; and Prof. W. T. Gordon and Dr. J. B. Simpson speaking for the palaeontologists. Strict attention to time-keeping—that bugbear of conferences—allowed also many comments from among the body of the audience. It was disappointing that neither of the first two speakers was present in person; but their communications were read for them.

Joint discussions have become a familiar and valuable feature of British Association meetings, and their purpose should not be misunderstood. They are seldom the occasion for the announcement of pro-

found scientific discoveries, but serve chiefly as short refresher courses by which men of science of various interests may keep abreast of developments in some of the problems which may not be their own more particular concern, while they give to those most closely associated with them the opportunity of taking stock, of estimating what changes of emphasis are desirable, and of incorporating new ideas. It is more especially with these latter points in mind that these few comments on the discussion have been prepared by one of the biologists who took part.

The present position of the theory of continental drift can, in outline in any event, be quickly stated. It is that while most biologists and palaeontologists find in some form of land-surface displacement the best working hypothesis to explain the facts of plant and animal distribution, and therefore tend to favour theories of continental drift, the majority of geophysicists and geologists reject it, not only because of the lack of direct positive evidence, but also because they know of no force capable of producing the required movement. This difference of opinion, here expressed in the briefest of terms, seems quite clear-cut, and calls for some consideration.

To begin with, there are two possible misconceptions to be cleared away. The idea of continental drift first found full expression in Wegener's theory (1912), in which a very definite chronological sequence of events is postulated, and more modern workers have modified this in various respects. Those who believe in continental drift need not necessarily, therefore, subscribe to all the details of Wegener, and this is not always fully appreciated. Rather similarly with the word 'drift'. Ideas formerly rigid have now become more supple, and support for some theory of continental displacement must not be taken to assume belief in exactly the kind of drifting movement suggested by Wegener. That there is nothing merely casuistical about these points can be shown by comparing the position of the biologists and geophysicists a little more closely.

The position of the biologists is that they are called upon to explain, within the terms of modern evolutionary theory, a great series of facts which, in a single phrase, may be called the remarkable floristic and faunistic relationships between distant countries. They find it impossible to believe that these are due to normal or even abnormal dissemination across the intervening spaces, and they are therefore obliged to think that the now sundered lands either were once connected by subaerial surfaces which have disappeared, or were once nearer to one another than they are at present. The former involves some theory of land bridges; the latter some theory of continental displacement. This is not the place to consider the relative merits of these and it can only be said that few, if any, biogeographers prefer the former to the latter. Nearly all, therefore, favour some displacement theory *faute de mieux*. If other scientific workers can provide them with a more satisfactory solution of their problems, well and good; but meanwhile the facts remain and have to be accounted for. Some biologists go further than this, and, with other protagonists of displacement, believe that the facts of biogeography afford direct evidence that this has taken place.

The position of most geophysicists and their co-workers, on the other hand, is that physical evidences and data must carry conclusive weight, and that since according to these evidences there is neither indication nor even possibility of continental drift, the idea