THE LABORATORY IN A SCHEME OF PREVENTIVE MEDICINE.*

BY

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THE use of the laboratory in the diagnosis, prognosis, and treatment of disease, and in investigations of circumstances, such as food and water supplies, involving the health and comfort of the individual and of the public, has steadily increased in recent years. Chemical and bacteriological work in connexion with examinations of milk and other foods, water, rivers, sewage effluents, etc., has become a regular part of the scheme of preventive medicine, and public analysts are among the regular officials of a Public Health Authority. The position with regard to human pathology is not so defined, and varies very much in different localities.

From its earliest days, and even then in its limited range, the Public Health Service has been particularly concerned with the prevention of infectious disease. It was natural, therefore, that with successive discoveries in the bacteriology and pathology of the infectious diseases, an increasing need for laboratory work in connexion with the Public Health Department should have been felt.

The Public Health Service has developed from being concerned mainly with the environment of the public into a more personal relationship with the individual in all forms of ill-health—not merely in a limited number of infectious illnesses. The need for the frequent and systematic aid supplied by the laboratory has grown correspondingly, and there are no Public Health Departments in this country without some arrangements more or less complete for this important purpose.

In the interest of individual and public health laboratory assistance should be systematized and made available for all persons for whom it may be required, not merely for those coming directly within the province of the Public Health Department in other ways. It is difficult to see how this could be arranged without the aid of the Public Health Department. This is shown by the frequent applications made to the department by medical practitioners for laboratory assistance, especially in the case of those patients unable to pay fees for the work done. While necessary in these cases, practitioners also find it convenient that in other cases the arrangements should be made by a central authority. This should not interfere with, but rather assist, the practice of specialists in pathology. The Public Health Authorities can avail themselves of practising pathologists; in the majority of cases this is the best and most convenient system, the function of the Public Health Authority being on the whole limited to seeing that such a service is available for everyone and that payment is made according to means.

It may be necessary occasionally that the Public Health Authority should itself supply pathological aid as well as provide for systematic assistance. Examinations for diphtheria and tubercle bacilli are often carried out with advantage directly by the officers of local authorities. The practitioners of a district find it very convenient to have these examinations performed locally, and to have arrangements made for receiving specimens at any time of the day or night.

In large cities the problem of systematizing laboratory aid is an easy one. Either a university, medical school, or laboratory attached to a large hospital, may be the centre at which the work is carried out, not only for the city itself, but for a large area around it. If there are specialists in the subject practising in the district, their services can be used. There are also excellent pathological institutes for carrying out the work. A systematic scale of fees can be arranged; outfits for taking the various specimens can be sent out; and the full time of the pathologist and his assistants can be occupied. Expert pathologists are always to be found in large centres of population.

In rural districts the problem is more difficult, although in countries so thickly populated as England and with such

convenient means of transport, there is little extra practical difficulty in using the large centres for most of the work; this is usually done.

There are comparatively few instances where laboratory aid for diagnosis, prognosis, or treatment is so urgent that this convenient and economical method of using large centres would lead to serious difficulty. Unless time is very pressing, there are distinct advantages in using a large laboratory where not only the experience of experts can be drawn upon, but also where students can profit by laboratory work on problems which will arise later in private practice.

When the public service and public funds of a local authority are involved, it is advisable, I think, to limit the pathological and bacteriological aid to essential work necessary for public and personal health. Experimental research comes under a different category; and although it ought to be encouraged, it cannot as a rule be considered to be within the scope of the ordinary duties of local authorities.

Specimens forwarded for examination through a local authority should generally be sent for a definite object, not in a vague hope that the laboratory can take the place of a careful examination of the patient and in this way supply a clue. Without underrating the value of laboratory aids in diagnosis, prognosis, and treatment, I deprecate the tendency to rely on them to the exclusion of thorough personal examination and clinical methods. Too much dependence on laboratory aid leads to lack of care in other methods concerned with the personality of the patient and destroys that careful investigation which should be so useful in every form of illness. The laboratory should be relied on to assist or confirm diagnosis rather than to make it. In diphtheria, for instance, where immediate specific treatment by antitoxin is so valuable, I have come across cases in which the delay caused by waiting for a laboratory result of a throat swabbing has seriously prejudiced the chance of recovery. In most cases diphtheria can be diagnosed without laboratory aid, and early treatment is so important that in probable cases the antitoxin treatment should not be delayed for a bacteriological result.

Another important point is that a negative pathological finding may lead to omission of specific treatment, which would be against the public and personal interest. This is occasionally found in cases of diphtheria, in which for various reasons, such as the previous use of antiseptics, or omission to take rubbings of both nose and throat, a negative result may be obtained where definite infection exists.

During the war I had an interesting example of how bacteriological investigation may cause considerable unnecessary inconvenience. On one of the fronts, most of a unit was held up for what was described as an outbreak of diphtheria, there being many positive cases reported from the pathological laboratory. On examining the men concerned, I was very doubtful of the diagnoses, and visited the laboratory, where I found that none of the cases really showed true diphtheria bacilli, but only diphtheroids. In other diseases besides diphtheria I have known of incorrect laboratory reports causing considerable inconvenience.

In spite of these drawbacks, however, the enormous value of pathological investigation makes its systematization essential, and as the Public Health Departments are bound to be the starting points of this work for the poorer section of the community, it must apparently be systematized in the Department of the Public Health Service.

Quite as important as the pathological investigation itself is the ability of clinicians to interpret pathological findings. One of the important reasons for the employment of the best pathologists is that they can frequently assist the clinician in the interpretation of results.

From the public health point of view, the pathological laboratory will generally be most commonly used for diagnosis with a view to proper treatment; another branch of its work, however, is the preparation of autogenous vaccines. As far as my experience goes, the number of applications for autogenous vaccines made by medical practitioners for their patients has recently decreased.

The provision of laboratory assistance by Public Health Authorities, beyond chemical and bacteriological work by the public analyst, has so far been more or less limited to cases of infectious illnesses, including venereal diseases and

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tuberculosis, and to a slowly growing extent in other departments, such as maternity and child welfare. The rapid advance in pathological science in so many conditions not recognized in the past as coming within the direct purview of Public Health Authorities has clearly demonstrated that systematic centralized pathological aid should be within the reach of everyone, being essential to any complete scheme of preventive medicine.

THE MANAGEMENT AND TREATMENT OF INCIPIENT CATARACT.*

BY

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THE treatment of early cataract has always exercised the minds of ophthalmic surgeons; it is a matter of daily importance to us and our patients, and a very great deal has been written and said about it. This is an opportune occasion for a renewal and exchange of our opinions and a confirmation or otherwise of our beliefs.

Incipient cataract is a condition in which localized grey opacities have appeared in the lens during adult life, and for which there is no obvious constitutional or local cause, either injury or disease. Such cases, for want of more precise knowledge, are usually labelled "senile cataract."

We might also include in our discussion the prodromal state preceding the development of actual opacity. Here there is an appearance of varying spots and lines on mirror illumination at different angles; fundus details may appear distorted by irregular lental astigmatism; fundus illumination may be relatively poor; the pupil reflex greyish; and a central dark circular zone may show on transmitted light. These phenomena we know are due to the formation of fluid clefts between the cortical lens fibres and to nuclear sclerosis.

In examining the lens I always employ the direct ophthalmoscopic method with +16 sph. behind the aperture, and use the slit-lamp if necessary for further details. On the discovery of lens changes we look for other accompanying senile ocular conditions such as vitreous degeneration, colloid bodies in the lamina vitrea, and macular or circum-papillary atrophy. We eliminate such complicating eye diseases as uveitis, retinitis pigmentosa, and detached retina, in which the lens opacity is likely to take the form of a subcapsular rosette at the posterior pole. We also exclude such special cataracts as "ray" cataract and those associated with dystrophia myotonica and parathyroid tetany.

Some forty years ago it was the custom in cases of immature cataract for some ophthalmic surgeons to combine preliminary iridectomy with artificial maturation of the cataract according to Foerster's method. The anterior chamber being emptied, the lens was massaged by rubbing the front of the cornea with a cataract spoon. The object was to avoid extracting an unripe cataract. Among these so-called "immature cases" there were probably many with useful vision which we should now classify as "incipient." The method was uncertain in its results; it did not affect the posterior cortex; it was liable to cause iritis, rupture the anterior capsule, or subluxate the lens with resulting vitreous loss when extraction was performed. It is unnecessary because we can extract immature cataracts successfully, and it is wrong because we cannot tell how slowly opacity will develop. In a paper on "The prognosis of incipient cortical opacities of the lens," Jessop drew attention to cases of striated cataract in which progress was extremely slow, and which he thought might be described as "arcus senilis lentis." Speaking of the terror of progressive blindness which the word cataract implies in the minds of the laity he advanced the opinion that a surgeon would be perfectly justified in saying that these were not cases of cataract if the patient asked the question. The case was cited of a patient who had 6/12 thirty years after being first told of cataract.

In this connexion the most striking fact, I think, in going through old records is the considerable number of patients over 60 years of age affected with incipient cataract, and yet the very small number of cases which reach the operative stage. Many cases that I have been watching for from ten to twenty years, or longer, have still useful vision (6/12 or more), and many others that have died were still seeing well.

Lens opacities are physiological in old age, and may be compared to white hair, baldness, and wrinkled inelastic skin. Old age is a relative term; it may be very premature or much deferred, and so we may find lens opacities acquired in middle age or even earlier. This applies particularly to "coronary" cataract, which occurs frequently, and may be found so early as to merit the term "pre-senile"; its course may be so gradual as to seem almost stationary.

It is our duty, therefore, in cases of incipient cataract to avoid frightening our patients with the dreaded word "cataract" when progress may be so slow and useful vision last so long. Where there is no appreciable defect in vision, as in coronary, striated, or dotted cataract, nothing need be said, unless to a discreet relation or friend.

With defective vision, perhaps progressively diminishing, as in the cuneiform and radial-spoke forms of cataract, and in posterior saucer-shaped cataract, some explanation will be necessary, and then, as Story has remarked, it becomes a matter of "diagnosing and treating a patient, not a disease." With a sensible patient a true statement and clear explanation of the lens opacity, illustrated by a diagram or model, I have always found the best course. With a highly nervous individual we should speak guardedly; as, for instance, of "cracks" or "flaws" in the lens, "such as come to all with age." I know a patient who completely collapsed when told there was evidence of cataract in her eyes; and another, a nervous excitable woman, who perpetually vowed eternal vengeance against an oculist who bluntly told her she had cataract many years before an operation was needed. She suffered a life of apprehension from that day. We must on no account make our cataract patients hypochondriacs and take all the hope out of their lives. We should rather comfort them with a cheerful optimism. It is dangerous to predict when operation will be necessary. A patient who had been told by an eminent oculist that she would probably need an operation within five years was managing very well twenty years later with 6/9 and Jaeger 1 in one eye and 6/18 and Jaeger 8 in the other, and she was then 85 years old. I could give other instances.

As a matter of course we seek to obtain the best possible vision with optical corrections, and we may to some extent be retarding the disease by relieving accommodation strain. We also retest periodically and alter our corrections according to the demands of a changing lental refraction; hypermetropia may become less, myopia develop or increase, and astigmatism may alter. The use of Crookes's, feuzal, or amber glasses in outdoor glare may help vision and protect the eyes from that radiant energy which is considered a fundamental predisposing factor in causing cataract. As lenticular opacity develops we instruct the patient how to get the best results from illumination, more intense for marginal and less intense for central opacities, and we determine if a weak mydriatic is any help. Incidentally, we watch tension, and should it rise from a swelling lens, iridectomy may need consideration. Reading vision may be improved with extra power in the presbyopic glasses, convergence for the nearer distance being relieved by prisms. The hand magnifier, or the "reading screen" made by Hawes, may be helpful, or both together; and I have known Galilean spectacles useful, but in such cases we are passing beyond the stage of incipient cataract.

What guidance in dealing with cataracts do we derive from pathological studies and researches into the constitution and properties of the lens? We know that the lens derives its nutrition entirely by endosmosis from the intra-ocular fluid. This fluid may be affected by any abnormal or toxic state of the capillary blood from which it is derived, and changes in the permeability of the capillary walls will also affect its character, while changes in the permeability of the lens capsule or in the epithelium lining

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