subcutaneous cartilages, and a well-ossified skeleton. They have no piers in the hyoid arches, and the hypobranchial part of the seventh arch ossifies its gills. The anterior arches are always provided with gills; but the fourth, fifth, and sixth form a rasp with teeth. The spiral valve in the intestine is absent, which is present in the ganoids. The conus arteriosus is lost; but the bulbus arteriosus is retained. The heart consists of an auricle and ventricle, and bulbus arteriosus, which corresponds to our pulmonary artery. There is no left auricle, ventricle, or aorta, developed in these fishes. For the first time, we find in them an essentially respiratory circulation. The pulmonary artery breaks up into several branches. The air-bladder, which in the ganoids has less of the character of a lung, is in the osseous fishes with ctenoid scales a closed air-sac. The blow-hole is also no longer retained. The mouth becomes considerably modified and perfect; a lower mandible is developed, so that the animal is better able to seize its prey. This is compensatory for the feebly developed pectoral fins which this family possess. The lower jaw is swung to the upper by the two postoral arches; but the lower jaw itself is developed from the first arch. From the manner in which the lower jaws are swung, these fishes are able to open their mouths to a great extent; in them, this hyostylic form of mouth is better developed than in any of the other fishes. They possess a row of scales running down along the back, which are connected with the secretion of slime. In these the slime-glands are placed, which are under the control of a nerve which runs down the back immediately under them. The osseous fishes are the newest formation in point of time, and acquire the greatest perfection in development.

ADDRESS

ON

THE RELATION OF DENTISTRY TO SURGERY.

Being the Presidential Address at the Association of Surgeons practising Dental Surgery.

By W. A. N. CATTLIN, F.R.C.S.

GENTLEMEN,—Allow me to express the gratification it affords me to know that, by the good-will of the Fellows of this Association, I have been elected to preside over the only society of dentists, composed entirely of educated surgeons, which has been formed in this country. I thank you for this honour, which is greatly increased by the fact that it has not been the custom for learned societies holding their meetings in London to select a President who resides, as I do, in the provinces. I congratulate the Association on the success of its first dinner. The cordial manner in which our views have been supported by the heads of the medical profession is, to say the least, encouraging. Another point of congratulation is, that a Fellow of this Society, and one practising our special branch of surgery (Mr. Imlach), now holds the office of President of the Royal College of Surgeons of Edinburgh. Mr. Hamilton Cartwright, in an interesting speech delivered by him at our late dinner, drew an analogy between the barber-surgeons and the dentists of an early period, and spoke of them as distinct callings; but I shall endeavour to show that even then surgery and dentistry were one science, and that they were practised together in the time of the poet Gay. In the fable of "The Goat without a Beard", he says, speaking of the goat:

"Resolv'd to smoothe his shaggy face,
He sought the barber of the place.
A flippant monkey, spruce and smart,
Hard by, profess'd the dapper art.
His pole with pewter basons hung,
Black rotten teeth in order strung,
Rang'd cups, that in the window stood,
Lin'd with red rags, to look like blood,
Did well his threefold trade explain,
Who shav'd, drew teeth, and breath'd a vein."

Having traced the surgical branch of our noble profession to a poor relation, I will leave Darwin to determine whether the artificial teeth worn by the ancients might not have been carved by some of our great-grandfathers!

"Man is born to trouble as the sparks fly upwards." Some of you will sympathise with me when I tell you that, having very little leisure,

I had worked hard to prepare an address embracing the modern history of Dental Reform, and had just completed it, when the postman delivered a copy of the *Transactions of the Odontological Society*, with its President's address in bold print upon the selfsame subject. I was consequently obliged hastily to prepare another, and must ask you to forgive its many faults. Without attributing "malice aforethought", I will refer you to his speech for much which is entertaining both in facts and figures, although I shall venture to differ from him in some of his most cogent arguments. Keeping the same subject in view, and comparing our own branch with the parent tree, I shall endeavour to show you, as we proceed, that both medical and dental science have had their days of darkness, error, and delay; and, indeed, if we may judge from recent discoveries, science in its general sense is only just expanding to the light of modern times. The learned President of the Odontological Society is perfectly satisfied that the "coping-stone" has been put upon dental reform; and that education, examination, and legislation, as applied to dentistry, are now "thorough". He also considers that, by the Dentists' Act, dentistry as a profession is for the first time "affiliated to the Royal College of Surgeons and its noble profession". I am naturally tempted to ask how it happens that this promising child, if legitimate, is kept in a home of its own, the *Dentists' Register*, and not admitted into its father's mansion, the medical one. The other night, I had a dream (forgive me if I speak figuratively), when more than five thousand dentists thronged around my bed in different costumes. The large majority were busy with their aprons on screwing down little iron frames, just as the undertaker does his wooden box; others were cooking in new-fashioned style by gas and steam; others, again, were stamping gold and setting teeth upon it, ever and anon puffing and blowing like an engine-pipe; a few were dressed as gentlemen, with a small mirror or a forceps in their hands, the latter with a spot of blood upon it; some were polite, and some were not; but *all by law were equal*. Some complained about the dirt and noise the others made, their want of scholarship; and altercation followed altercation, until a fight arose; and, just as happened in the upper heavens, the wiser won, and drove the others out of their community.

"Is this a dream? then waking would be pain;
Oh, do not wake me; let me dream again."

As medical politics still force themselves upon us, it may be amusing as well as instructive to confine our thoughts for a short time to the consideration of the early struggles which hindered the development of some of the Medical Colleges. Should we be driven to found an institution of our own, let us be forewarned that changes of great importance cannot suddenly be made; and, although we live in days of rapid progress, great undertakings will require the fostering hand of time to perfect them. The College of Physicians was at one time a very exclusive body; it is now a hall of courteous gentlemen. From being stiff and unyielding, it has bent as readily to the spirit of the times as any other institution.

One of the greatest obstructions with which the College of Surgeons had to contend, in its early educational department, was the repugnance of the public to be anatomised. So difficult was it even to obtain small portions of the human frame for dissection, that thin bodies with thick heads would probably at that time have been worth most in a moribund condition. It is a little humiliating to be reminded of the time of a body-snatcher named Burke, who, with accomplices, actually suffocated people in the streets, and carried them, when scarcely cold, into the dissecting-rooms. Parts of the human body were, moreover, hawked in various private surgeries; and the dead were raised from their graves, but not in the living state. So complete has been the success of the Anatomy Act, that every difficulty in this respect has been removed; the public now live and die in peace, and have derived incalculable benefits from the better education of medical students. Indeed, so great has been the change, that the best subjects are now of little value, and perhaps before long a cremation company may be a profitable investment. There was a time, not many years ago, when the first surgeons of the day boasted of their ignorance of medicine; when the most difficult operations were performed with the utmost skill, yet the risk of life was great during the after-treatment. Thanks to the knowledge of medicine possessed by such men as the late Sir Benjamin Brodie and that model of British surgeons Sir James Paget, this blot upon common sense has been removed. From the same cause, it has fallen to my lot to witness much unnecessary suffering, wasted health, and even death, from ignorance in the practice of Dental Surgery. If we go back to the year 1815, when the Apothecaries of England and Wales obtained their Act of Parliament and began to remove the main obstruction to their progress, we shall perhaps find an example in them which we may imitate. At that time, the majority kept open shops, and sold pink saucers, smelling-bottles, brushes, drugs, and chemicals, and were really more vendors of medi-

cines than medical practitioners. According to Shakespeare, they were far from being a wealthy class. Feeling their degraded position (for the physician of that day scarcely condescended to consult with an apothecary), they set to work in right good earnest to improve themselves. The law not being retrospective, the more educated were allowed to continue in practice upon very slender evidence of their skill, until they were extinguished by effluxion of time. The better men, whilst using the powers of their new Act to prevent empirical practice, instituted most creditable examinations, the severity of which was gradually increased until the Apothecaries' licence became one of the best, if not the best, test of medical knowledge. The public as well as the medical mind by slow degrees became convinced that medicine in its broad sense included surgery, and hence arose the superior class of general practitioners who now hold the double qualification. As education increased, the custom of charging exclusively for medicines became distasteful; and, to meet a rising want in this respect, the druggists improved themselves, and have become the chief dispensers of medicines. It is, indeed, curious to note how gradually every improvement in the medical profession has taken place, and how certainly every requirement has been supplied. Let us hope that the same good fortune may happen to ourselves. For some time past, the great principle advocated by the London University, of conducting one thorough examination as a test for medicine and surgery, within one portal, has been growing into popularity; and the signs of the times plainly indicate that such a system is about to become the law. Thus far, since the year 1815, the object of the legislature has been, and now is, to consolidate the different classes of medical practitioners and equalise medical education; and it is much to be lamented that the Dentists' Act should have passed just at this crisis, as it is a strange contradiction of the whole scheme.

With these examples before us, let us deliberately consider whether our own history differs materially from them. Like the apothecaries, we cannot boast of a high pedigree; and, like them, our advancement has been slow and gradual; but we have not yet progressed so far. The first grand effort in the shape of progression was made about twenty-four years ago by the formation of the Odontological Society, and it is almost impossible to estimate the amount of good, by example and precept, which that one Society has done. Its last proceedings have, however, I fear, not been in harmony with its former acts. The Dental Hospital, the late College of Dentists, the Dental Licence, and our own Association, have all, in their particular way, contributed to the improvement which is evident and noticeable in our ranks. Show-cases, like the apothecaries' shops, will gradually disappear; advertisements are both less frequent and less vulgar; and I believe the amount of scientific knowledge which dental surgeons have contributed to the general stock of literature will bear favourable comparison with any other specialty. All was proceeding well with dentistry, until the Dentists' Act in 1878 fell like a withering storm and cut it from the parent tree. Looking earnestly at the present position of medical politics and the wide difference of opinion which prevails among different grades of dental practitioners, I am led to think that the hour of danger has arrived, and that this Association will have an anxious duty to perform during the present session of Parliament. Hasty legislation has led to difficulties of a serious character. The *Dentists' Register* practically separates dentistry from surgery, and in my opinion is an error of the highest magnitude. Its blighting influence will be more apparent as time rolls on. It will scarcely be believed that, if a surgeon (who may or may not be a dental licentiate) decline upon principle to register his name in the *Dental Register*, he is, by Sections XIX and XXVIII of the Dentists' Act, deprived of the privilege of serving as an examiner upon the Dental Board of his own College, unless he sits, which is highly improbable, as one of its surgical members. Probably this flaw is an oversight, and will be altered as soon as the mistake is pointed out. Our subcommittee, appointed some time ago, will watch the progress of the Medical Acts Amendment Bill, and, if possible, prevent the abuse of medical titles. They will again urge the legislature to forbid unqualified persons to use the title of "surgeon", either alone or in conjunction with any other word or words.

Still the question meets us at every turn, What further action ought this Society to take under existing circumstances? Unless some effectual step be quickly taken, dentists as a body will be isolated, and, I fear, compelled to found a College of their own. In that case, by the constitution of Fellows and Members, some scheme might be arranged for the gradual separation of the surgical from the mechanical branch, thus imitating the old apothecaries by casting off the detrimental "shop". It is to be regretted that, out of 5,289 names which appear in the *Dentists' Register*, only 533 have given positive evidence of either a medical or a dental education. If the Dentists' Act be allowed to remain un repealed, what security is there that practitioners of other

branches of surgery will not apply for and obtain a similar statute? If the Dentists' Act be repealed—and I heartily trust it may be—to prevent a repetition of the evil, it has been suggested that, when the proposed conjoint examining board is formed, a candidate should notify that, in addition to the ordinary examination of a medical practitioner, he desires to be examined particularly as to his proficiency in dental, aural, orthopaedic, or any other branch of surgery; and, if he shall show a thorough knowledge of any such branch of surgery, a certificate to that effect should be appended to his diploma, and he should be allowed to appear in the *Medical Register* as practising that specialty. This certificate would in no way interfere with his practising generally, as, being a fully qualified surgeon, he would be entitled to practise one or every branch. In any and every case, the dental licentiates should be encouraged to complete their surgical education, and for that purpose great facilities should be given to them during the next three years. They are the cream of the rising generation of dentists—their guiding stars of future hope. If a little learning be a dangerous thing, and if it be true of all professions that he who is only half-educated can only be half-trusted, then the dental licentiates will be most unwise if they remain in their present anomalous position. Finally, I should like to see established in this great metropolis consulting practitioners, who, ripe with experience and not dim with age, would throw a halo of respectability around the whole profession. If they would arrange to meet their brethren in the surgeries, I believe they would frequently be consulted by them, as well as by members of the medical profession.

During the progress of the Dental Practitioners' Bill, I had an interview with its chief promoter, Mr. Tomes—a name worthily honoured as a scientific dentist. I hope, like myself, he was afflicted with mental colour-blindness, and did not see at that time the mischievous tendencies of this Bill. If otherwise, not even the glory of having received two public testimonials can save his high reputation from the blame of having inflicted a great injury upon some of the best men in his own profession. My amiable rival, the President of the Odontological Society, pointing his remarks straight at this Association, has thrown down the gauntlet of defiance by asserting that "they who had the power to carry the Dentists' Act have also the power to maintain it". On behalf of this Association, I reply:

"Thrice is he armed who has his quarrel just,
And he but naked, though locked up in steel,
Whose conscience by injustice is corrupted."

It does not quite accord with my ideas of brotherly fairness to indulge in terms of general complaint without delivering a bill of indictment, and, if possible, suggesting some remedy which might help to heal any one of the sores from which the Fellows of this Association are at present smarting. I will, therefore, in my individual capacity, say candidly what course I think it would be right to take to repel the serious charges which may now be brought against dentists of being the first to sow the seed of discord, and of unnecessarily tearing an useful branch from the glorious old tree of medical science, and that too after its roots had been formed, and just when its branches were about to be trimmed and gathered into harmonious unity by the proposed new scheme of conjoint examination. Those who have done and assisted to do this can best make amends by retracing their steps. I would suggest, as a remedy, that the worst clauses of the Dentists' Act should be repealed, and that only enough of it should remain to authorise the registration of dentists who were in practice prior to August 1st, 1879, and such others as are not yet ripe for medical registration. All qualified practitioners now on the *Dentists' Register* I would carry as fast as I could to the *Medical Register*, and for the future adopt the scheme suggested by my son (Mr. W. Cattlin) for the benefit of all specialists, such as aurists, oculists, dentists, etc. Should any of the "qualified" still desire to remain on the *Dental Register* to die out by effluxion of time with the "unqualified", I would leave them alone in their glory, and keep them warm under the very "coping-stone of reform", of which my friendly rival is so proud, until the dream I mentioned to you has been fully realised. It will, I am sure, be the pride of our Association to help to promote any good object, whether originated by ourselves or not, and especially to hold out the right hand of fellowship to those who, though differing with us in opinion in minor matters, may show a readiness to work with us for the general good.

I thank you for the attentive manner in which you have listened to my remarks, which, on account of urgency, have been confined almost entirely to the politics of our profession. Even should the civil war which has begun last the whole of the term of my presidency, rest assured that the scientific department of the Society shall not be neglected.

THE name of W. J. Eames, Fleet-Surgeon, was accidentally omitted last week in the list of new members of the King and Queen's College of Physicians of Ireland.