



From afar



phasis], face-to-face communication.' Bird drew heavily on the media theorist Marshall McLuhan, especially his observations that, in the electronically interconnected society of postwar America, 'ours is a brand-new world of allatonceness', as he and his co-author Quentin Fiore put it in *The Medium Is the Massage* (1967): "'Time' has ceased, 'space' has vanished.' So too with the clinic: the teledoctor defined 'telemedicine' as 'the practice of medicine without the usual physician-patient physical confrontation'. Interactive television created new possibilities of being together, even when apart.

Telepresence brought peril as well as promise. How could a doctor or patient know whether the video quality was good enough to simulate the face-to-face presence of a direct physical examination? Artefacts or poor focus might lead to a missed diagnosis. Measures of parity obsessed Bird and the TV engineers who set up the clinic. They assembled archives of visual data to establish where, exactly, to set the threshold of 'good enough' diagnostic image quality. If a doctor could see a lesion in the blood vessels of the conjunctivae in person - that is, the red streaks in the 'whites' of your eyes - would that same lesion be visible to another doctor looking at that eye on a TV screen several miles away? Consider the photographic prints pasted onto the page in the figure below, depicting three television screens, which themselves depict images of the eye exams of a model patient at three different camera settings. In hundreds of images like these, testing the influence of different permutations of cameras, lenses and video-enhancement algorithms on the ability to distinguish key features on microscopic, radiological and physical examinations, Bird launched a new science of similarity, documenting the equivalence of telepresence and physical presence.

In a well-designed telemedical interface, argued Bird in a 1970 paper co-authored with the lead nurse practitioner Marie Kerrigan, 'the fundamental doctor-patient relationship is not only preserved, but often it is actually augmented, enhanced, and seemingly more critically focused.' Let's consider the terms more closely, as Bird and Kerrigan did. Bird's microwave transmitters 'augmented' the signal to travel long distances; he developed image 'enhanced' filters for TV signal processing; and the ability to shift between wide-angle and long-lens cameras allowed his teleclinic to be 'critically focused'. In his more expansive moments, Bird hoped the TV frame could engineer more than 'good enough' medicine; it could deliver better medicine. 'Telemedicine can provide as much or more [my emphasis];' he insisted, 'than the actual physical presence and direct interviewing of the physician.' Despite these hopes, in fact many doctors and patients found telepresence to be a poor substitute for physical presence.

Television medicine provided more modes of contact than telephone medicine, but was still limited to sight and sound and the constraints of the camera frame. The absence of touch, of smell and of the sensibility we use to navigate interpersonal interactions persisted. The sociologist Joel Reich, in a 1974 report on telemedicine that took Bird's clinic as its principal model, tried to catalogue all the things not present in telemedical encounters. Reich's account of telemedicine is a history of the senses: visual and aural were present, yes, but olfactory, gustatory, thermal and haptic channels were not. They were all missing, and their absence was crucial.

'Until such a time as Smell-o-Vision became a reality,' Reich half-joked, 'with contemporary interactive television the loss of the olfactory channel is complete.' Reich compiled a list of roughly 50 diseases for which the use of smell might still play a part in routine diagnosis. The clinical significance of losing smell (and taste, for that matter) was minuscule, but they were losses all the same. Nor was it clear that a nurse practitioner, standing in the same room as the patient, could develop an adequate language for describing odours verbally to a physician on the other end of a telemedical circuit. A similar concern related to the relevance of colour. Bird's studies of visual thresholds for telemedical parity assumed black-and-white television was more practical for telediagnosis. When colour was relevant, for example, when diagnosing a skin rash, practitioners on both ends could refer to numbered codebooks (analogous to the Pantone Color chart) to convey the right colour. Colour could be standardised and rendered legible at both ends of the black-and-white television circuit in ways that smell could not.

These losses paled in comparison with losing touch, or the 'haptic channel'. Some elements of touch, like the sensation of hot and cold, could be captured using thermometric sensors and transmitted electronically as graphs, charts or raw numerical data. Yet the single quantum of temperature could not contain all the qualitative information captured by a physician's hand on a clammy brow. The haptic channel also works two-ways: the hand of the physician is both a sense organ and a means of providing communication, reassurance, a form of therapy in its own right. Another hand, perhaps that of a nurse practitioner in the same room with the patient and the television camera, might act as a limited prosthesis for some of these functions, but not all.

Bird suggested that other technologically mediated senses and agreed-upon codes of interaction would compensate for the loss of touch. 'There are several uses of telemedicine circuitry,' he noted, 'in which a modification of the normal co-presence ritual may have to be considered eventually.' After all, wasn't our own presence in the three-dimensional world in part a construct of our shared social reality, a set of etiquettes and protocols that had evolved over millennia but could be re-engineered to work, perhaps better, in electronic forms? Just as deep-sea divers learned to communicate with coded hand gestures in a benthic environment that did not permit oral communication, doctors and patients could figure out new codes for telemedicine.

Bird focused on proofs of parity, and since then much of the scientific literature on telemedicine has likewise been concerned with demonstrating that the services provided by medicine at a distance are equivalent, even if not identical, to those provided by flesh-and-blood encounters. This evidence is uneven: well-developed in the highly visualised fields of radiology and pathology, or in tele-vanguard fields of psychiatry, neurology and cardiology. It is harder to document in more generalist fields, including primary care internal medicine, obstetrics and gynaecology, and paediatrics, and especially difficult in procedure-based surgical fields. The difference between these fields is not absolute but relative. It is a difference of stakes and proof, and who faces the risks and costs if something is lost along the way.

There are vast differences in the social norms of technology and the political economy of care that separate the medical use of the 19th-century telephone from the health apps of the 21st-century smartphone.

TO BE CONTINUED